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THE DEWEY REPORT ON WAGES IN MANUFACTURING INDUSTRIES IN THE UNITED STATES

By

Albert Earl James

A Thesis Submitted for the Degree of

MASTER OF ARTS

UNIVERSITY OF WISCONSIN

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SECTION I.

INTRODUCTION

(a) THE OBJECT OF WAGE STATISTICS.

(b) THE TWELFTH CENSUS REPORT.

WAGES IN MANUFACTURING INDUSTRIES
IN THE UNITED STATES
1890-1900.

SECTION I.

Prof. Mayo Smith in his work "statistics and Economics" P. 295 has the following apt sentences on the object of all statistical investigation in wages: "Their object is to determine the ordinary income of that portion of the population represented by the wage receivers, and what that income is worth in procuring a comfortable subsistence. The chief value of such an inquiry is not to elucidate a theory of distribution of the product into wages, interest, rent and profits, but to answer the question of social well-being."

This definition brings out clearly four fundamental propositions: (1) Wage statistics deal chiefly with incomes, (2) they are limited to a certain definite class in the social organization- the wage-earners, among whom there are no subdivisions except those of income, (3) they are not complete without an inquiry into prices, and (4) wage investigations are social investigations and proposition (1) is the most essential and indispensable. In other words the social significance of wages is solely a

matter of their purchasing power, the necessities, comforts and luxuries that the average wage-earner can buy with the labor of his hands. Individual wage-earners may rise or fall in the social scale but the class remains and it is the function of wage statistics to indicate the well-being of that class. This being true the wage received is paramount, the work done for it , the degree of skill required to command it are subordinate, while the particular industry or occupation to which the worker belongs are matters of secondary importance in a general wage investigation. Two questions only are to be answered to meet the requirements of this social viewpoint-(1) Is he a wage-earner? (2) What is his wage?

But the other point of view indicated in the sentence quoted above is by no means unimportant. The matter of "labor cost", the proportion of the total cost of the finished product which goes to the laborer who produced it, is of the highest importance to the manufacturer. Such a statistical investigation is however not an inquiry into wages. It is merely a statistical study of the "cost of production" counting the laborer only as the capital, the coal, the steel, the transportation charges are counted in assigning that cost to its various factors. It is statistics of this kind that are found in the regular census publications and it was to supply the larger and more

important demands of the social side of thewage problem that the "Twelfth Census Special Report on Employees and Wages" was made. This report is commonly known as the "Dewey Report" from the name of the statistician who conducted the investigation - Prof. Davis R. Dewey of the Massachusetts Institute of Technology. It was a special inquiry instituted after the general census returns were in and was the result of the failure of the census proper to indicate to the satisfaction of the census authorities (1) rates of wages, (2) average incomes, (3) the distribution of wage-earners in the wage scale. Indeed any investigation which fails to take into account this last fails absolutely to meet the essential requirement of wage statistics i. e. that they shall be an index of social progress of the average man himself. The Dewey Report dealt exclusively with manufactures. It covered the two years 1890 and 1900. Thirty-three of theleading manufacturing industries of the country were investigated, which industries employed in each year about half of the wage-earners of the country. Of these industries representative establishments were selected and their payrolls copied for 105,000 employees in 1890 and 160,000 in 1900. These rates of wages given for the week and hour, and also earnings in a week were tabulated (1) by occupations, then by sections of the country and finally summarized by industries for the whole country. The tabulation was in groups

of 50¢ for week rates and 1¢ for hour rates. The summaries were obtained wholly upon the percentile basis; the median and quartiles being the only average secured. Prof. Dewey wisely regarded the arithmetic average as misleading. To have found it,however, would have made possible an interesting study in the correlation of this average with the median which study cannot now be accurately made. The mode and measure of dispersion were also disregarded as were the finer measures of the percentile method - the deciles. No attempt whatever was made to use the graphic method. No general results were obtained for all the industries combined. The fact that only two years are considered makes impossible all deductions as to any tendencies shown by the statistics. In his analysis of the results Prof. Dewey in comparing 1890 with 1900 frequently speaks of a "rise" or a "fall" in wages. This is clearly unfortunate; 1890 was near the culmination of the rise which broke in 1893. 1900 saw the panic over and the rise of wages and prices which began about 1898 was then just well started. But without several additional decennial reports no movement in wage statistics can be safely traced. The present work is an effort to summarize this Dewey Report and to give in both years general results for all the industries for the whole country. Questions of method both general and technical have arisen and are treated in the body of the work where they have seemed to fit most easily. In the main the discussion of the report in the following pages

may be thus summarized:

1. A general analysis of the report with special referance to the methods of gathering the data therein contained.
2. The wages of adult males in 1890 and 1900 including a study of the cumulative curve and its advantages when used in the graphic representation of wage statistics.
3. The wages of adult females, and of children of both sexes.
4. Averages and methods of tabulation in wage statistics with special reference to the Dewey Report; treating of the arithmetic average, the mode, and concentration in wage statistics on certain wage groups or points of wage payment.

SECTION II.

THE DEWEY REPORT, GENERAL ANALYSIS.

-SYNOPSIS-

(a) THE REPRESENTATIVENESS OF THE DEWEY REPORT.
  (1) FOR ALL MANUFACTURES.
  (2) FOR EACH INDUSTRY INVESTIGATED.
  (3) GEOGRAPHICALLY.
(b) THE METHOD OF SECURING DATA FOR COMPARING ONE YEAR WITH ANOTHER.
(c) 'SKILLED AND UNSKILLED LABOR IN WAGE STATISTICS.

SECTION II.

Professor Dewey's investigation was limited to thirty-three manufacturing industries and to only a small proportion of the establishments in those industries. Thus wage statistics were secured for only a small part of the total number of wage-earners actually engaged in American manufactures. Table I shows the number of adult males engaged in all manufacturing industries from which the Dewey Report gives statements of wages, the total number of adult males whose rates of wages were actually returned, and the per cent. which this last total is of the whole number in the industries investigated and of the total number in all manufacturing industries in the whole country for 1890-1900.

TABLE I.

Adult Male Wage-earners (a) in the United States (b) in the Industries Given in the Dewey Report, (c) in the Dewey Report Itself, and with Percentages as Indicated

Years	(a) Number Employees in all Manufactures.	(b) Number Employees in Dewey Industries.	Percentage Employees in Dewey Industries to Total in all.	(c) Number Employees Whose Rates were investigated	Percentage. c to b	c to a
1890	3,327,042	1,788,966	53.77	105,453	5.89	3.17
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

As in all restricted investigations, we are here met at the outset with the question, Are these returns representative? Little more than half the total of all manufacturing wage-earners are included in the thirty-three industries, and of these the returns of wage rates were secured from only a small percentage of the total number of employees.. Numbers, however, are an indifferent test. It would seem that an investigation which included 3 to 4 per cent. of all the wage-earners in manufactures in the country should give an excellent idea of manufacturing wages as a whole. But in the first place the industries selected must cover the whole range of our national manufactures, and, more important still, must include those broadly typical of the whole. Table II gives a list of the industries from which data were secured by Prof. Dewey, and the percentage of all employees in each industry whose wage rates were actually returned, 1890-1900.

TABLE II.

Industries in the Dewey Report and Percentage of Adult Male Employees in Each Industry Actually Returned, 1890-1900.

Industries.	1890.	1900.
Textile industries:		
Carpet mills	5.59	6.10
Cotton mills	3.24	3.28
Knitting mills	1.89	2.17
Dyeing and finishing textiles	10.76	11.07
Woolen mills	8.51	11.35
Wood-working industries:		
Agricultural implements	10.38	25.90
Furniture	3.79	3.96
Lumber and planing mills	2.84	3.46
Pianos	6.76	9.69
Wagons and carriages	3.26	3.42
Metal-working industries:		
Car and railroad shops	4.34	5.05
Foundries and metal-working	10.14	11.27
Iron and steel mills	11.43	11.55
Shipyards	19.05	17.93
Miscellaneous industries:		
Bakeries	3.11	3.02
Breweries	10.59	9.54
Candy	3.16	3.61
Chemicals	27.77	25.09
Cigars	1.17	1.71

Industries .	1890.	1900.
Miscellaneous industries continued:		
Clothing	.56	.89
Collars and cuffs	8.60	10.54
Distilleries	2.59	5.27
Flour mills	2.19	3.33
Glass	7.69	10.62
Paper mills	3.74	3.09
Potteries	2.61	1.66
Brickyards	.27	.40
Printing	2.79	2.41
Rubber	22.07	11.04
Shoes	1.50	2.39
Slaughtering	21.47	13.43
Tanneries	6.10	9.10
Tobacco	32.38	28.33

This list of industries seems to have been chosen with great care, and ought to be fairly representative of the whole manufacturing field. We have already seen (Table I) that the percentage of adult male wage-earners whose rates of wages were actually investigated to the total number of wage-earners in manufactures was in 1890 3.17 per cent. and in 1900 3.91 per cent. So general an average as this is, however, likely to mislead. An investigation of a statistical nature is peculiarly liable to err, if the several parts are not in themselves representative. Data

that are faulty not only are worthless in themselves, but carry their weaknesses through all summaries and into all results. Unlike mere mechanical errors of tabulation, these errors in collected data are unlikely to be self-correcting. It is, therefore, necessary that each of the various industries treated in the Dewey Report should have returns large enough to fairly represent that industry. Table II A is a summary for all the industries, showing the number of industries in each of several percentage groups and indicating in a general way to what extent the Dewey Report may be considered to be representative of all the industries investigated.

TABLE II A.

The Number of Industries Grouped according to the Percentage of Employees in Each whose Wage Rates were returned.

Groups of Percentages.	1890.	1900.
All groups	33	33
Under 1%	2	2
1% to 1.99%	3	2
2 " 2.99	5	3
3 " 4.99	7	8
5 " 9.99	6	6
10 " 19.99	6	9
20% and over	4	3

Mr. Arthur L. Bowley, one of the greatest authorities on wage statistics in any country, attacked the report in a recent number of the Royal Statistical Journal. one

of his points being that Professor Dewey had not reported as many as a thousand employees in several industries. But surely the only fair test is the percentile test already applied, and by this test the Dewey Report seems in vastly the greater part to be sufficiently representative of each industry.

But quite as important as this is the question of geographical distribution. It will be remembered that the Aldrich Report was confined almost exclusively to New England and the Middle Atlantic States. This was clearly unfortunate. The economic sections of the country are widely different, and no report can possibly represent conditions or even relative changes without carefully considering each section in nearly its relative importance to the manufacturing wage-earning class. For the Dewey Report establishments of the various industries were selected from every section of the country, and it only remains to be seen whether more or less wage-earners were selected in any section than should have been to satisfy the requirements of reasonable accuracy. In Table III are given the percentages of the total number of wage-earners in the country distributed by sections as returned by the Census Report of Manufactures, Part I, and the percentage of the total number in the Dewey Report taken from each section.

TABLE III..

The Distribution of Adult Male Wage-earners by Geographic Divisions.

Geographic Divisions.	1890.		1900.	
	Census Report.	Dewey Report.	Census Report..	Dewey Report.
United States	100.0	100.0	100.0	100.0
New England States	19.3	12.1	17.8	10.5
Middle States	38.5	36.4	37.2	36.0
Southern States	9.7	7.1	12.3	6.2
Central States	28.2	40.3	27.7	42.3
Western States	1.8	0.0	2.3	0.0
Pacific States	2.5	4.1	2.7	5.0

From this table it appears that, geographically considered, Prof. Dewey's selection of wage-earners is only fairly representative. The Middle States and the West, as a whole, are given proper weight, but New England and the Southern States are somewhat neglected, while the Central States are noticeably over-represented. The question immediately arises, has this defect in the selection of data appreciably influenced the results of the investigation? This question may be answered by a simple test. The Census of Manufactures provides us average wages in different sections of the United States, as follows:-

	1890.	1900.
New England States	$509.33	$507.12
Middle States	540.62	528.71
Southern States	364.83	334.96
Central States	470.84	488.51
Western States	565.91	577.09
Pacific States	620.39	577.11

These averages, though inaccurate for some purposes, are sufficiently accurate to show whether a general average based upon them and weighted by the actual proportions of wage-earners in the several sections of the country would differ materially from a similar general average weighted by the proportions which characterized Prof. Dewey's selection. The results of this test (Table IV) show that in 1890 the average weighted according to the true proportions differs from the average weighted according to Prof. Dewey's proportions by only ten cents. In 1900, however, the over-weighting of the Central Division is shown to have exercised an appreciable influence. It appears above that the only important manufacturing section of the country showing an increase is the Central States.

TABLE IV.

Weights.	1890.	1900.	Percentage of Excess Dewey over Census 1900.
Census proportions	$499.60	$492.32	
Dewey proportions	499.50	499.85	1.53%

In short, from these results it seems fair to con-

clude that Prof. Dewey presents a somewhat too favorable picture of conditions in 1900.

Professor Dewey's investigation, while made in 1901-02, included two years within its scope; namely, 1890 and 1900. The method of securing the comparison was, briefly, this: The men engaged in field work were restricted in securing data to those industries and establishments which were in existance at both these dates. They then copied from the pay-rolls of these establishments the number of employees and their respective rates of wages in each year. This was done apparently upon the theory that the thing desired was an index of the change in wages. Any broad, general movement would doubtless be fully revealed by this method; but, if the thing which we would measure is the social well-being of the laboring class, is the method correct? Should not new establishments and new industries which arise be given their full representation ? Doubtless their competition in the labor market will have its effect upon the industries and establishments already existing, but we cannot depend wholly upon the "fluidity" of labor. If our returns are to have any social meaning, if they are to fulfil the fundamental purpose of wage statistics, they must be for each year broadly representative, not merely of particular industries and establishments, but of manufactures as a whole. Therefore, the exclusion of any data necessary for the above

purpose merely because it was not included at some prior data defeats the very object for which the investigation was made. In each year we must have returns broadly representative.. Then we will let the comparisons take care of themselves. The Dewey Report, however, covered so broad a field and was so thoroughly representative in that field that this error probably had little influence upon the results obtained. That the idea itself was misconceived should, I think, clearly appear from the fact that, if rigidly and logically adhered to, it should be applied not merely to industries and establishments, but also to occupations and individuals! Such a rule would, of course, be a practical impossibility. But suppose the present method be persisted in. In a few decades the constant changes of occupations, firms, and establishments, and even industries to which our manufactures are subject, would gradually exhaust all our available data. It may be suggested that in each census a comparative study may be made, covering, as did Prof. Dewey's, two census years. I would answer, first, that such a study is expensive; second, that it is either useless or breaks the continuity of the statistics from decade to decade; and, third, that it is wrong in principle. The end to be attained is a true picture of wages in each decennial year, and all methods not necessarily conducive to that end are of doubtful value.

Finally, it has been frequently stated, and nowhere more emphatically than in the Census Reports, that the wages of skilled and unskilled workmen cannot be averaged, that no single index number or average can be obtained in which is summed up the whole condition and trend of wages, that comparisons of the whole wage-earning class from one period to another are necessarily based upon the assumption that there has been no change in the proportions of the skilled and unskilled. Prof. Dewey opens his discussion with a quotation from Part I, page CXII, of the Census of Manfactures, in which is this statement: "An average obtained by dividing the number of wage-earners into the total amount of wages is misleading. The argument that such an average is serviceable for purposes of comparison from one period to another must presuppose that the proportion of skilled and unskilled labor at the two periods for which the average is returned remains substantially the same." This is doubtless true of an arithmetic average, but not because of the problem of handling statistics of skilled and unskilled wage-earners. It is not necessary here to treat of the weakness of the arithmetic average in wage statistics. But, when it is once obtained and used, why may not changes in the proportions of skilled and unskilled enter into the calculations, just as any other cause which may bring about a general change in the rates of wages? Surely, if the welfare of

the wage-earning class is the thing we are investigating , an increase or a fall in the demand for skilled workmen, any change in the proportion which they bear to the whole, is as much to be taken into account as the demand for labor itself or a change in the prosperity of the country.

SECTION III.

THE DEWEY REPORT (Continued).

THE WAGES OF ADULT MALES.

SYNOPSIS,-

(a) THE UNWEIGHTED SUMMARY AND THE CUMULATIVE CURVE AS A METHOD OF GRAPHIC REPRESENTATION OF WAGE STATISTICS.

(b) THE WEIGHTED SUMMARY.

SECTION III.

DEWEY REPORT (Continued).

THE WAGES OF ADULT MALES.

We have seen that the Dewey Report while imperfect in some respects is yet on the whole probably the most reliable report on wages in the United States. Its strength lies mainly in the two facts (1) that it is broadly extended over every kind of manufacturing and includes enough wage-earners to be representative; and (2) that the data are presented in practically their original form and the averages obtained (the median and quartiles) are far preferable to a mere index number or arithmetic average which give no indication of the welfare of the various wage groups, no idea of changes in relative distribution and no datafrom which these things may be computed. The great fault to be found with the Dewey Report aside from the question of method already treated is that no final results were obtained in the investigation as a whole. Each industry was briefly summarized and there the discussion stopped. The wage-earners in each industry were first divided into 50¢ groups and then assigned to their particular occupational group. These were in turn gathered together by sections of the country and finally a grand total found for the entire industry in the whole country. This summary was perfectly right. So long as our data is preserved in its original

form, or in small groups, it is immaterial to what extent we combine establishments or industries, since it is the wage obtained, and not the nature of the work done, which is of importance to us in dealing with wage statistics. This being the case a final summary grouped as were all the others showing the distribution o wage-earners. in all wage groups in all the industries for the whole country might well have been obtained.

This then was the first thing to be done in a study of the Dewey Report the object of which was to find the wages prevailing in manufacturing industries in the United States in 1890 and 1900. The method used was simply that indicated above, adding thesummaries for each industry as divided into wage groups thereby getting a summsry for all the industries covered by the report. Table V contains the results so obtained with their cumulative and absolute percents for 1890 and 1900.

TABLE V.

Summary for All Industries. Distribution of Adult Male Wage-earners in Wage Groups 1890 - 1900.

	1890.			1900.		
Rates per Week.	Number	Absolute per Cents.	Cumulative per Cents.	Number	Absolute per Cents.	Cumulative per Cents.
Total	105,453	100.00	100.00	160,859	100.00	100.00
Under $2.00	30	.03	100.00	21	.01	100.00
$2.00-$2.49	164	.16	99.97	108	.07	99.99
2.50- 2.99	280	.27	99.81	484	.30	99.92
3.00- 3.49	1,210	1.15	99.54	1,141	.71	99.62
3.50- 3.99	1,132	1.07	98.39	1,535	.95	98.91
4.00- 4.49	1,625	1.54	97.32	1,754	1.09	97.96
4.50- 4.99	2,105	2.00	95.78	2,598	1.62	96.87
5.00- 5.49	1,783	1.69	93.78	2,482	1.54	95.25
5.50- 5.99	958	.91	92.09	1,416	.88	93.71
6.00- 6.49	3,762	3.57	91.18	4,795	2.98	92.83
6.50- 6.99	2,681	2.54	87.61	3,169	1.97	89.85
7.00- 7.49	3,818	3.62	85.07	6,289	3.91	87.88
7.50- 7.99	5,738	5.44	81.45	9,495	5.90	83.97
8.00- 8.49	6,256	5.93	76.01	8,998	5.59	78.07
8.50- 8.99	1,934	1.83	70.08	4,263	2.65	72.48
9.00- 9.49	9,508	9.02	68.25	16,319	10.15	69.83
9.50- 9.99	2,949	2.80	59.23	7,487	4.65	59.68
10.00-10.49	3,816	3.62	56.43	5,299	3.29	55.03
10.50-10.99	10,817	10.26	52.81	12,820	7.97	51.74

TABLE V (Continued).

1890.

Rates per Week.	Number	Absolute per Cents.	Cumulative per Cents.	Number	Absolute per Cents.	Cumulative per Cents.
11.00-11.49	2,426	2.30	42.55	4,515	2.81	43.77
11.50-11.99	1,786	1.69	40.25	2,887	1.80	40.96
12.00-12.49	7,347	6.97	38.56	11,126	6.92	39.16
12.50-12.99	1,694	1.61	31.59	4,385	2.73	32.24
13.00-13.49	2,000	1.90	29.98	4,039	2.51	29.51
13.50-13.99	4,156	3.94	28.08	5,936	3.69	27.00
14.00-14.49	2,227	2.11	24.14	4,057	2.52	23.31
14.50-14.99	951	.90	22.03	2,004	1.25	20.79
15.00-15.49	5,099	4.84	21.13	7,560	4.70	19.54
15.50-15.99	834	.79	16.29	1,680	1.04	14.84
16.00-16.49	1,371	1.30	15.50	2,125	1.32	13.80
16.50-16.99	2,069	1.96	14.20	3,349	2.08	12.48
17.00-17.49	855	.81	12.24	1,437	.89	10.40
17.50-17.99	656	.62	11.43	1,173	.73	9.51
18.00-18.49	2,968	2.81	10.81	3,862	2.40	8.78
18.50-18.99	391	.37	8.00	612	.38	6.38
19.00-19.49	508	.48	7.63	655	.41	6.00
19.50-19.99	767	.73	7.15	970	.60	5.59
20.00and over	6,782	6.42	6.42	8,014	4.99	4.99

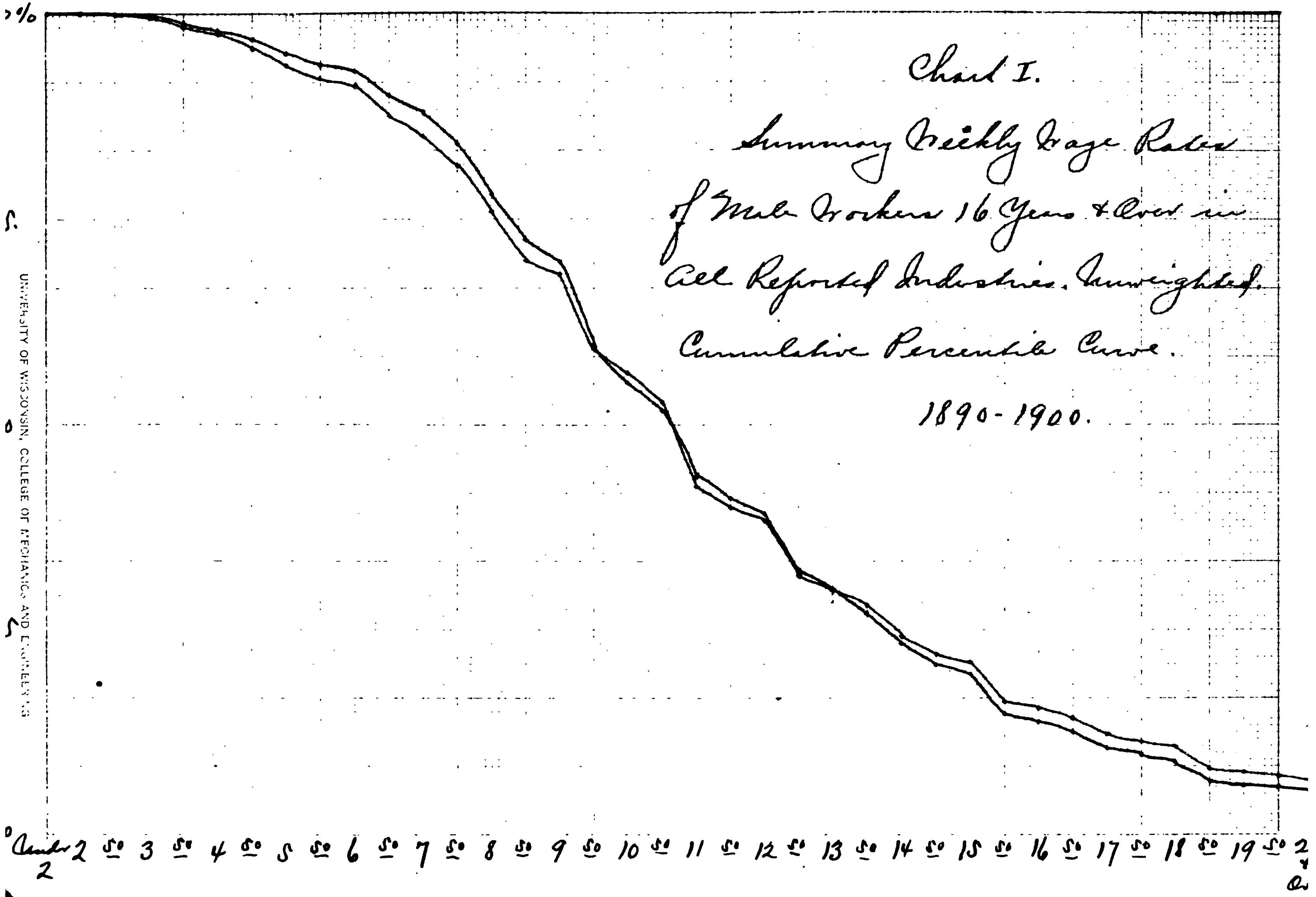


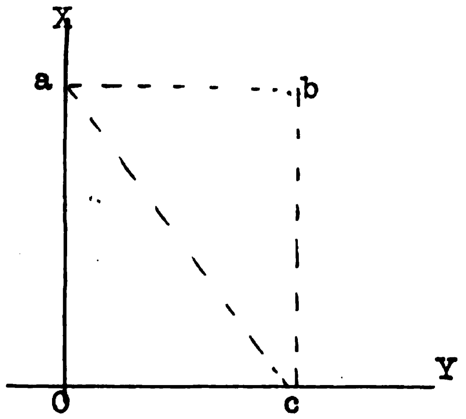
Chart I.

Summary Weekly Wage Rates of Male Workers 16 Years & Over in All Reported Industries. Unweighted. Cumulative Percentile Curve.

1890-1900.

UNIVERSITY OF WISCONSIN, COLLEGE OF MECHANICS AND ENGINEERING

Where possible a graphic representation of statistics is always desirable and often brings most clearly the essential points of the phenomena with which we have to deal. For this purpose I have used a cumulative percentile curve, plotting upon one ordinate the cumulative percents given above and upon the other the wage groups to which they correspond. This curve has several advantages over other graphic methods for our particular purposes . In the first place the use of the cumulative percents locates automatically the median, quartiles and other desired percentile points and the curves for different years may be plotted together and their points of variation noted at a glance.. Again the curve thus formed is regular in its outlines. But perhaps the most important point of all is the fact that within the triangular figure bounded by the ordinates and the curve is included the total amount of wages paid. Thus if 100 men are paid 50 at $2.00, 25 at $3.00, and 25 at $4.00 or a total of $275. our cumulative curve would express it thus: 100% at $2.00, 50% at $1.00 more and 25% at $1.00 more or a total of $275. Then any change in the area of this triangle, or any variation in its shape is of the greatest significance to the student of wages. Take, for instance, the ordinates OX, and OY.



Let a be the 100% on X and c the highest wage point on Y. Then in an ideal distribution in which all the wage-earners receive the highest possible wage our curve would take the rectangular shape Oabc. A perfectly uniform distribution which in a frequency curve would form a straight line parallel to OY, would give us the triangle Oac; and the worst distribution in which all workers would receive nothing is indicated by the lines aO, Oc. In other words our distribution from the social point of view becomes more favorable as our curve becomes convex and approaches a b c as a limit and becomes unfavorable as it becomes concave and approaches a O c . This test may be applied to any part of the curve to determine for that part conditions, or relative change between two periods, since the line bc may be shifted and remains by hypothesis always parallel to aO.

Chart one contains the cumulative percents of 1890 and 1900 plotted in wage groups. The curve presents an interesting study. If we apply our test curve at the 9.50 group we find that up to that point 1900 is an improvement

over 1890, but from there to the end 1890 leads, and on the whole there seems to be but little difference between them. The curve suggests (a) a slightly higher wage paid to the unskilled labor in the lower groups and (b) quite as pronouncedly less to the better paid workmen. The rise begins at $2.00 per week and continues threugh the $9.00 group. From $9.00 to $13.00 the two curves are close and show neither rise nor fall. From $13.00 on the fall in wages of the more highly paid becomes more pronounced. These results are subject to two interpretations. (1) there may have been an actual rise and fall as shown or (2) the wage of every wage-earner may have remained the same and the new labor introduced have entered the lower groups. In either case the results are equally unfavorable for the workers as a class.

But this method of obtaining a summary of the Dewey Report is open to serious objection. Although we know that the returns for most of our industries are truly representative and those which are not are safely to be left to the theory of probability when combined as here to make so large a base; yet if we grant the reliability of our returns for each industry when a total summary is obtained as above we do not know that it is either reliable or representative . For we have thus far paid no attention to the relative importance of the industries thus combined and may have given an industry reported fully by Prof. Dewey far too much weight and much too little to those

from which he secured comparatively few returns. Thus in Table II we have already noted that the percent of each industry returned varies for adult males from 27.77% of Chemicals to .27% of Brickyards employees. If our results are to be correct they must give to each industry its rightful weight in accordance with the total number of workmen employed therein as reported by the 1900 Census of Manufactures page I for the years 1890 - 1900. This weighting was done for each industry for each year in the following manner: In the Dewey Report the total number of adult males whose rates of wages were secured is given for the entire industry for each year divided up among the various wage groups. The total number actually employed in each industry as returned by the Census were divided in thesame manner giving to each wage group the same proportion of the total as it had in the Dewey Report. Expressed in a proportion we should have for say the $5.00 group if the Dewey total were 100, the Census 1,000 and the number in the group in the Dewey Report 2-100 : 1,000 :: 2 : X or 20. This having been done for all the industries for each year a summary was obtained for all industries as before. The distribution in the wage groups of each industry was thus exactly as in the Dewey Report but the total obtained by adding the various industries both contained all the wage-earners actually in those industries and gave to each industry its real and true weight. The resultsthus obtained are presented in Table VI.

TABLE VI.

Distribution of Adult Male Wage-earners in Wage Groups

Dewey's Report Weighted

	1890			1900.		
Rates per Week	Number	Absolute per Cents.	Cumulative per Cents..	Number	Absolute per Cents.	Cumulative per Cents.
Total	1,788,966	100.00	100.00	2,232,509	100.00	100.00
Under $2.00	503	.03	100.00	975	.04	100.00
$2.00-$2.49	3,163	.18	99.97	3,330	.15	99.96
2.50- 2.99	5,337	.30	99.79	9,385	.42	99.81
3.00- 3.49	21,555	1.20	99.49	20,653	.93	99.39
3.50- 3.99	27,496	1.54	98.29	30,431	1.36	98.46
4.00- 4.49	28,491	1.59	96.75	30,092	1.35	97.10
4.50- 4.99	34,181	1.91	95.16	42,655	1.91	95.75
5.00- 5.49	35,566	1.99	93.25	60,379	2.70	93.84
5.50- 5.99	19,924	1.11	91.26	23,828	1.07	91.14
6.00- 6.49	67,594	3.78	90.15	74,849	3.35	90.07
6.50- 6.99	43,050	2.41	86.37	48,333	2.17	86.72
7.00- 7.49	56,758	3.17	83.96	93,580	4.19	84.55
7.50- 7.99	87,516	4.89	80.79	123,990	5.55	80.36
8.00- 8.49	105,119	5.88	75.90	125,450	5.62	74.81
8.50- 8.99	26,597	1.49	70.02	51,697	2.32	69.19
9.00- 9.49	164,093	9.17	68.53	211,730	9.48	66.87
9.50- 9.99	40,155	2.24	59,36	87,050	3.90	57.39
10.00-10.49	77,403	4.33	57.12	80,521	3.61	53.49
10.50-10.99	121,462	6.79	52.79	140,883	6.31	49.88

TABLE VI (Continued).

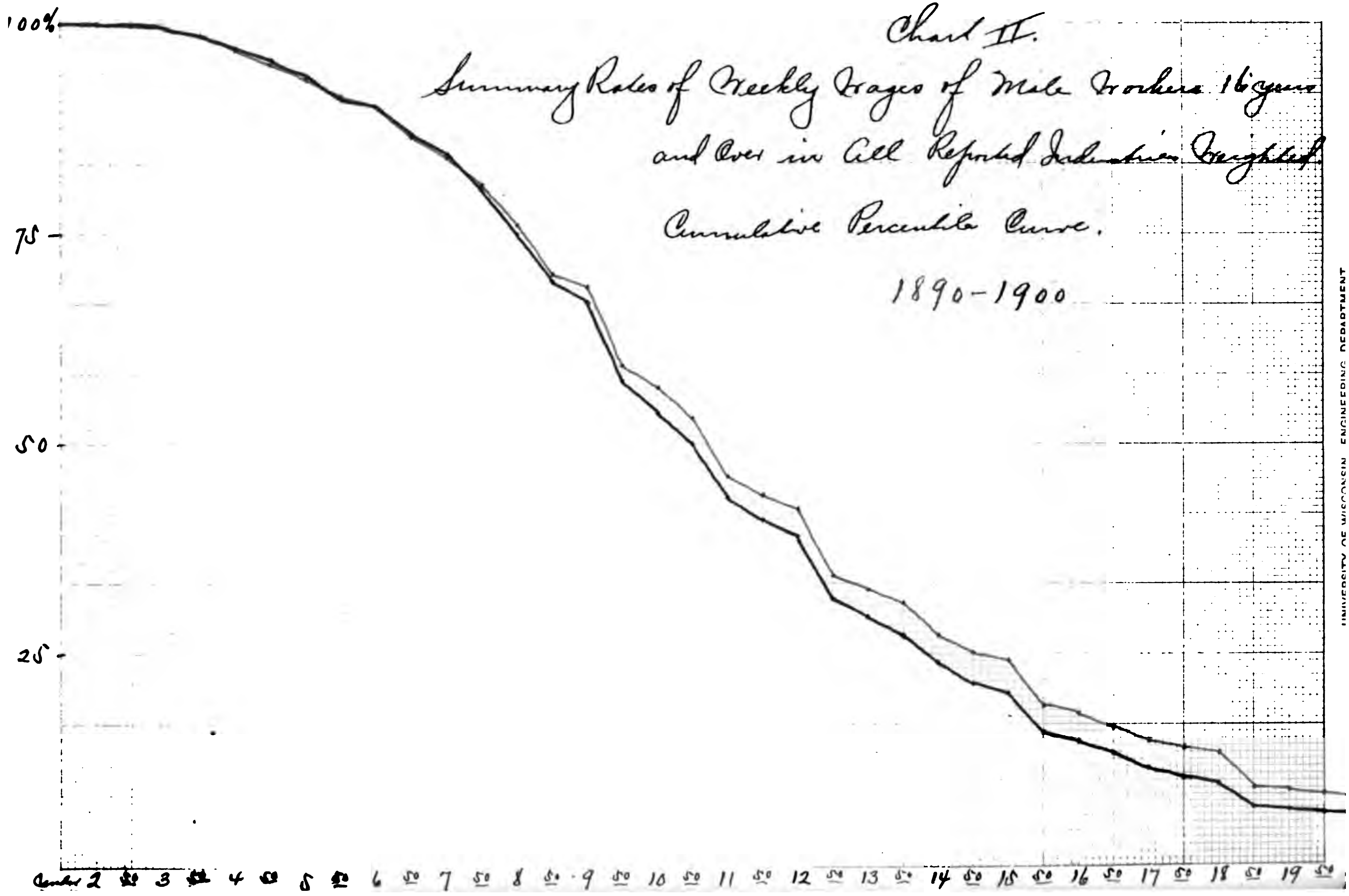
	1890.			1900.		
Rates per Week. $	Number	Absolute per Cents.	Cumulative per Cents.	Number	Absolute per Cents.	Cumulative per Cents.
11.00-11.49	42,060	2.35	46.00	63,224	2.83	43.57
11.50-11.99	28,523	1.59	43.65	38,785	1.74	40.74
12.00-12.49	139,168	7.78	42.06	166,187	7.44	39.00
12.50-12.99	26,471	1.48	34.28	48,471	2.17	31.56
13.00-13.49	33,305	1.86	32.80	50,796	2.28	29.39
13.50-13.99	66,945	3.74	30.94	69,235	3.10	27.11
14.00-14.49	38,716	2.16	27.20	56,667	2.54	24.01
14.50-14.99	14,246	.80	25.04	24,537	1.10	21.47
15.00-15.49	99,658	5.57	24.24	104,985	4.70	20.37
15.50-15.99	12,523	.70	18.67	20,681	.93	15.67
16.00-16.49	29,046	1.62	17.97	32,991	1.48	14.74
16.50-16.99	30,390	1.70	16.35	42,125	1.89	13.26
17.00-17.49	16,213	.91	14.65	24,326	1.09	11.37
17.50-17.99	10,575	.59	13.74	14,093	.63	10.28
18.00-18.49	73,706	4.12	13.15	64,946	2.91	9.65
18.50-18.99	6,340	.35	9.03	7,341	.33	6.74
19.00-19.49	8,618	.48	8.68	9,144	.41	6.41
19.50-19.99	10,998	.61	8.20	10,563	.47	6.00
20.00 & over	135,502	7.59	7.59	123,601	5.53	5.53

Chart II.

Summary Rates of Weekly Wages of Male Workers 16 years and Over in All Reported Industries Weighted.

Cumulative Percentile Curve.

1890-1900



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Plotting a curve with the above data as before we have the curve shown in Chart II. This Chart, which probably shows with reasonable accuracy the results which may be deduced fromthe Dewey Report as to adult male wage-earners , seems to indicate that wages were, on the whole, lower in 1900 than in 1890. Instead of, as before, a rise in the lower wage groups, we have here apparently no change until about the 7.50 group at which point the 1900 line falls below and the distance between the two curves grows as we proceed into the higher groups. At the end of the curves the 1890 data shows that 7.59%.of the adult male wage-earners in manufactures were earning $20 or more per week, while the similar percentage for 1900 is only 5.33%. Moreover , as pointed out on page 13 in Table IV the material for the Dewey Report was so selected that undue weight was given the one section of the country showing material increase in wages in manufactures between the years 1890-1900. Thus the error in the Report is opposed to the results obtained. What the proper weights would have given we can only surmise, certainly they would not have made a showing more favorable to the social well being of the worker than is that in Chart II.

However, there is still possible a test of this result. It has already been pointed out in Section II pages 14 and 15 that the method of restricting data secured for comparison to the establishments returned in both years

was unwise as tending to lessen the representative quality of the work. We have also noted that Prof. Dewey's returns are so broadly representative as probably not to be affected by the error in the method. Fortunately the men who did the work in the field when they found it convenient returned the 1900 payrolls of many establishments whose payrolls for 1890 could not be obtained. These results were tabulated separately for the industries in which they were secured and added to the establishments for which comparative returns were given. These returns were grouped in a supplement to the regular report under the caption "1900 Total," which included the total returns for all the industries for which these extra data weresecured. When to this is added the returns for 1900 of those industries for which extra returns were not obtained the result gives us not merely a larger base but it also furnishes an interesting test of the representativeness of the total already given. Table VII contains this result arranged in the wage groups with their accompanying absolute and cumulative percentages, and in Chart III the cumulative percentages for 1900 given in Table V are plotted in comparison with those of the proceeding table (VII).

TABLE VII.

The Distribution of Male Wage-earners
Sixteen Years and Over, 1900.

Wage Groups.	Number.	Absolute per Cents.	Cumulative per Cents	Cumulative Percentages of Table V.
Total	182,223	100.00	100.00	100.00
Under $2.00	36	.02	100.00	100.00
$2.00-$2.49	138	.08	99.98	99.99
2.50- 2.99	561	.31	99.90	99.92
3.00- 3.49	1,403	.77	99.59	99.62
3.50- 3.99	1,774	.97	98.82	98.91
4.00- 4.49	2,127	1.17	97.85	97.96
4.50- 4.99	2,997	1.64	96.68	96.87
5.00- 5.49	2,981	1.64	95.04	95.25
5.50- 5.99	1,606	.88	93.40	93.71
6.00- 6.49	5,686	3.12	92.52	92.83
6.50- 6.99	3,504	1.92	89.40	89.85
7.00- 7.49	7,585	4.16	87.48	87.88
7.50- 7.99	10,475	5.75	83.32	83.97
8.00- 8.49	10, 036	5.51	77.57	78.07
8.50- 8.99	4.713	2.59	72.06	72.48
9.00- 9.49	18,342	10.07	69.47	69.83
9.50- 9.99	8,205	4.50	59.40	59.68
10.00-10.49	6,110	3.35	54.90	55.03
10.50-10.99	13,980	7.67	51.55	51.74

TABLE VII (Continued).

Wage Groups. $	Number.	Absolute per Cents.	Cumulative per Cents.	Cumulative Percentages of Table V.
11.00-11.49	5,058	2.78	43.88	43.77
11.50-11.99	3,368	1.85	41.10	40.96
12.00-12.49	12,597	6.92	39.25	39.16
12.50-12.99	4,716	2.59	32.33	32.24
13.00-13.49	4,897	2.69	29.74	29.51
13.50-13.99	6,792	3.73	27.05	27.00
14.00-14.49	4,670	2.56	23.32	23.31
14.50-14.99	2,276	1.25	20.76	20.79
15.00-15.49	8,617	4.73	19.51	19.54
15.50-15.99	1,808	.99	14.78	14.84
16.00-16.49	2,451	1.35	13.79	13.80
16.50-16.99	3,725	2.05	12.44	12.48
17.00-17.49	1,634	.90	10.39	10.40
17.50-17.99	1,304	.72	9.49	9.51
18.00-18.49	4,395	2.41	8.77	8.78
18.50-18.99	662	.36	6.36	6.38
19.00-19.49	724	.40	6.00	6.00
19.50-19.99	1,153	.63	5.60	5.59
20.00 & over	9,117	4.97	4.97	4.99

The curve obtained is surely a remarkable proof of the probable accuracy of the Dewey Report. The addition of the wage data of nearly 22,000 wage-earners or about 12.5% of the whole reported for the comparison in 1900 makes

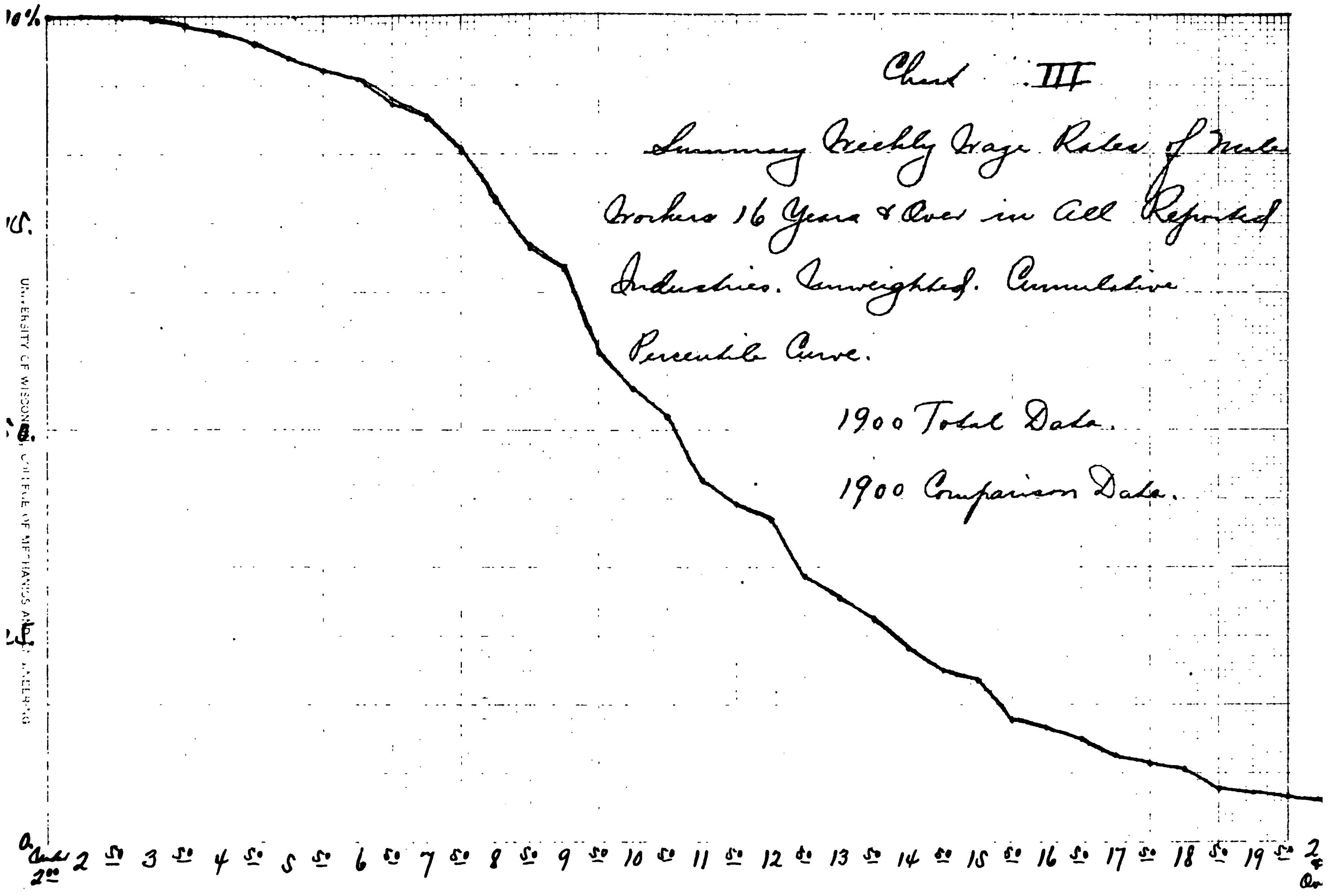

Chart III

Summary Weekly Wage Rates of Male Workers 16 Years & Over in All Reported Industries. Unweighted. Cumulative Percentile Curve.

1900 Total Data.

1900 Comparison Data.

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SECTION IV..

THE DEWEY REPORT (Continued).

THE WAGES OF ADULT FEMALES AND
OF CHILDREN..

SYNOPSIS,-

(a) THE WAGES OF ADULT FEMALES.

(b) THE WAGES OF MALES UNDER 16.

(c) THE WAGES OF FEMALES UNDER 16.

SECTION IV.

THE WAGES OF ADULT FEMALES AND OF CHILDREN.

Thus far we have dealt only with the adult male wage-earners, but the Dewey Report gave returns also for adult females and for children classified by sex. Table VIII is a statement of the number of adult females engaged in all manufacturing industries, of the number of adult females engaged in those industries from which the Dewey Report gives statement of female wages, the percent which this number is of the whole, a total of all adult females whose rates of wages were returned by Dewey and the percent which this total is of the whole number in the industries investigated and of the totalnumber in all the industries in the country.

TABLE VIII.

Adult Female Wage-earners (a) in the U. S. (b) in the Industries of the Dewey Report (c) whose Wage Rates Were Actually Returned in the Dewey Report 1890-1900.

(a) Number Employees in All Manufactures.	(b) Number Employees in the Dewey Report Industries	Pct. of Total in Dewey Industries to Total in All Manufactures.	(c) No. of Employees Whose Rates of Wages Were Actually Investigated.	Pct. of (c) to (b)	Pct. of (c) to (a)
1890--803,686	439,745	54.71	13,327	3.03	1.66
1900-1029,296	555,640	53.99	17,151	3.09	1.67

It will be noted that the percentage either of the

total of all manufactures or of those industries included in the Dewey Report is less in the case of females than of males and probably therefore the returns themselves are less representative. It seemed best therefore not to go to the additional labor involved in weighting the result as was done for male workers but merely to secure direct from the Dewey Report a summary which would indicate for that report, at least , how things stood. The fact that Chart I and Chart II differ so little in their general results as they do, would seem to indicate that the matter of weights is not of primary importance, and need be resorted to only where no doubt should be left as to just what results the data do really give. Table IX (Corresponding to Table V for males) gives the results obtained by adding the groups of wage-earners in all the industries reported.

TABLE IX.

Summary of All Industries, Dewey Report. Distribution of Adult Female Wage-earners in Wage Groups. 1890-1900.

	1890.			1900.		
Rates per Week	Number	Absolute per Cents.	Cumulative per Cents.	Number	Absolute per Cents.	Cumulative per Cents
Total	13,327	100.00	100.00	17,151	100.00	100.00
Under $2.00	116	.87	100.00	127	.74	100.00
$2.00-$2.49	360	2.70	99.13	497	2.90	99.26
2.50- 2.99	307	2.30	96.43	563	3.28	96.36

TABLE IX (Continued).

	1890			1900		
Rates per Week	Number	Absolute per Cents.	Cumulative per Cents.	Number	Absolute per Cents.	Cumulative per Cents.
$3.00-$3.49	812	6.09	94.13	955	5.57	93.08
3.50- 3.99	826	6.20	88.04	1,058	6.17	87.51
4.00- 4.49	1,480	11.11	81.84	1,662	9.69	81.34
4.50- 4.99	1,614	12.11	70.73	1,848	10.78	71.65
5.00- 5.49	1,619	12.15	58.62	1,912	11.15	60.87
5.50- 5.99	1,113	8.35	46.47	1,389	8.10	49.72
6.00- 6.49	1,725	12.94	38.12	2,309	13.46	41.62
6.50- 6.99	792	5.94	25.18	1,112	6.48	28.16
7.00- 7.49	657	4.93	19.24	857	5.00	21.68
7.50- 7.99	587	4.40	14.31	659	3.84	16.68
8.00- 8.49	432	3.24	9.91	482	2.81	12.84
8.50- 8.99	224	1.68	6.67	381	2.22	10.03
9.00- 9.49	227	1.70	4.99	486	2.83	7.81
9.50- 9.99	103	.77	3.29	178	1.04	4.98
10.00-10.49	89	.67	2.52	239	1.39	3.94
10.50-10.99	37	.28	1.85	147	.86	2.55
11.00-11.49	22	.17	1.57	71	.41	1.69
11.50-11.99	10	.08	1.40	51	.30	1.28
12.00-12.49	54	.41	1.32	70	.41	.98
12.50-12.99	18	.14	.91	17	.10	.57
13.00-13.49	6	.05	.77	19	.11	.47

TABLE IX (Continued).

Rates per Week $	1890. Number	1890. Absolute per Cents.	1890. Cumulative per Cents.	1900. Number	1900. Absolute per Cents.	1900. Cumulative per Cents.
13.50-13.99	16	.12	.72	10	.06	.36
14.00-14.49	8	.06	.60	10	.06	.30
14.50-14.99	3	.02	.54	3	.02	.24
15.00 & over	70	.52	.52	39	.22	.22

Chart IV shows the cumulative percentile curve for adult females for the years 1890 and 1900 plotted as before. There seems to be no remarkable change in wages. Between five and eleven dollars the curve indicates a slight increase. But the thing most notable is the disgracefully low wage received. Fifty percent received less than $5.50, seventy-five percent less than $6.50, only ten percent received more than $8.50, and the percent receiving $15.00 or more is infinitesimal.

As already stated the Dewey Report gave returns for children classified by sex. They are not so classified by the census of manufactures Part I page 1 and no comparison is therefore possible by which we may learn the proportion of the total number engaged in manufactures whose wage rates were secured by Prof.Dewey. For the males data were secured from nineteen industries of the total thirty-three and these returns are probably fairly reliable. For the

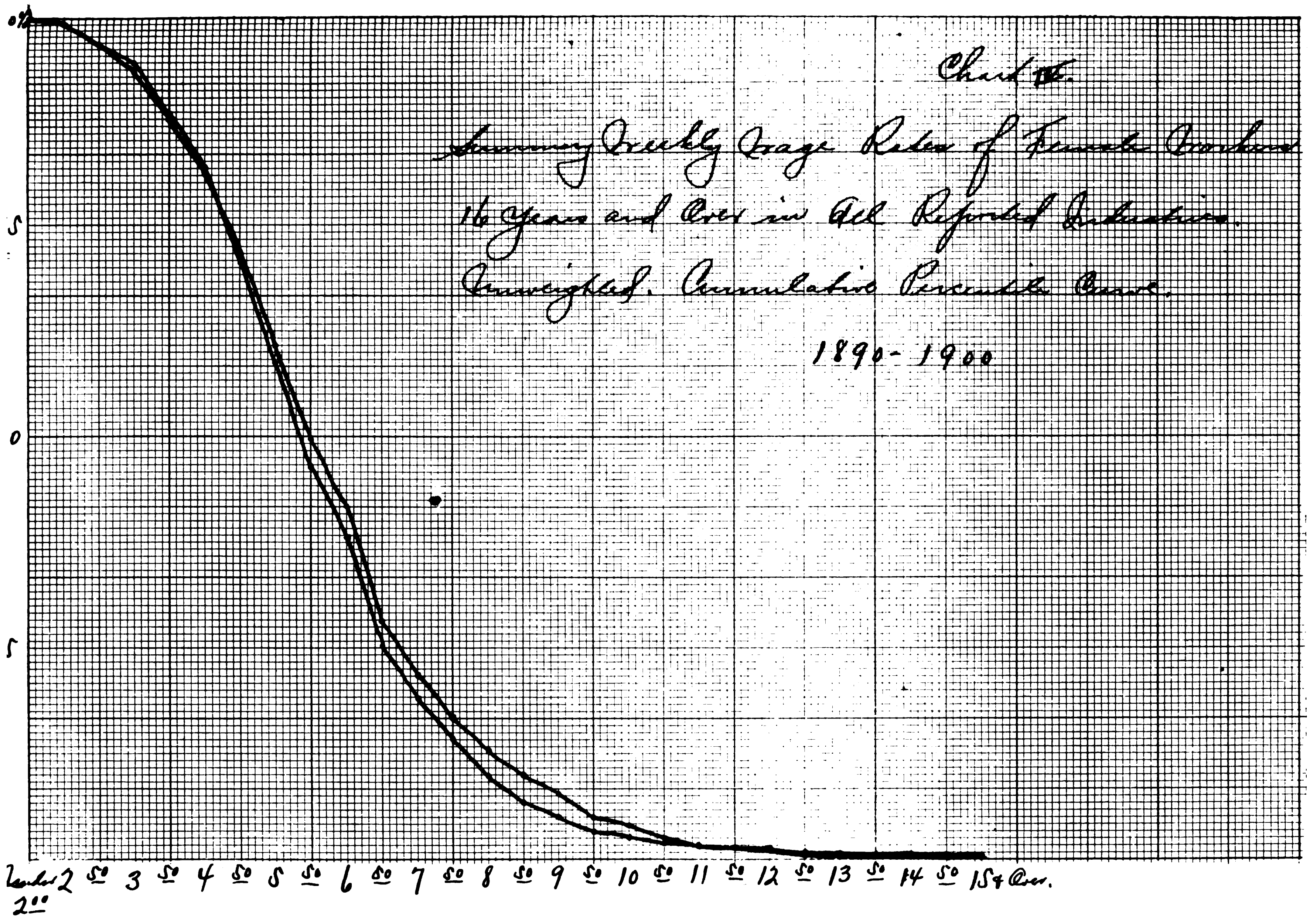

Chart VI.

Summary Weekly Wage Rates of Female Workers 16 Years and Over in All Reported Industries. Unweighted. Cumulative Percentile Curve.

1890-1900

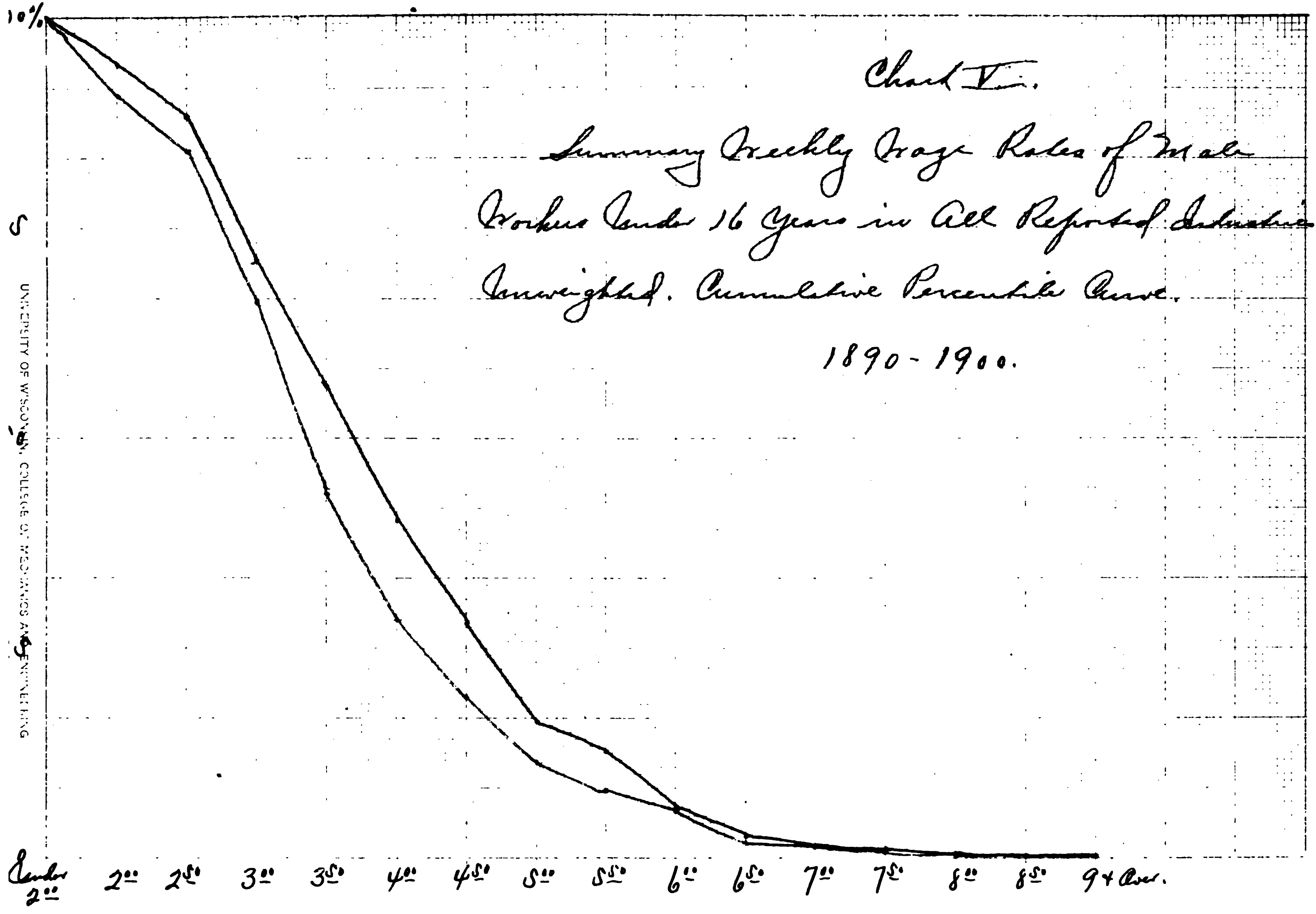

Chart V.

Summary Weekly Wage Rates of Male Workers Under 16 Years in All Reported Industries. Unweighted. Cumulative Percentile Curve.

1890-1900.

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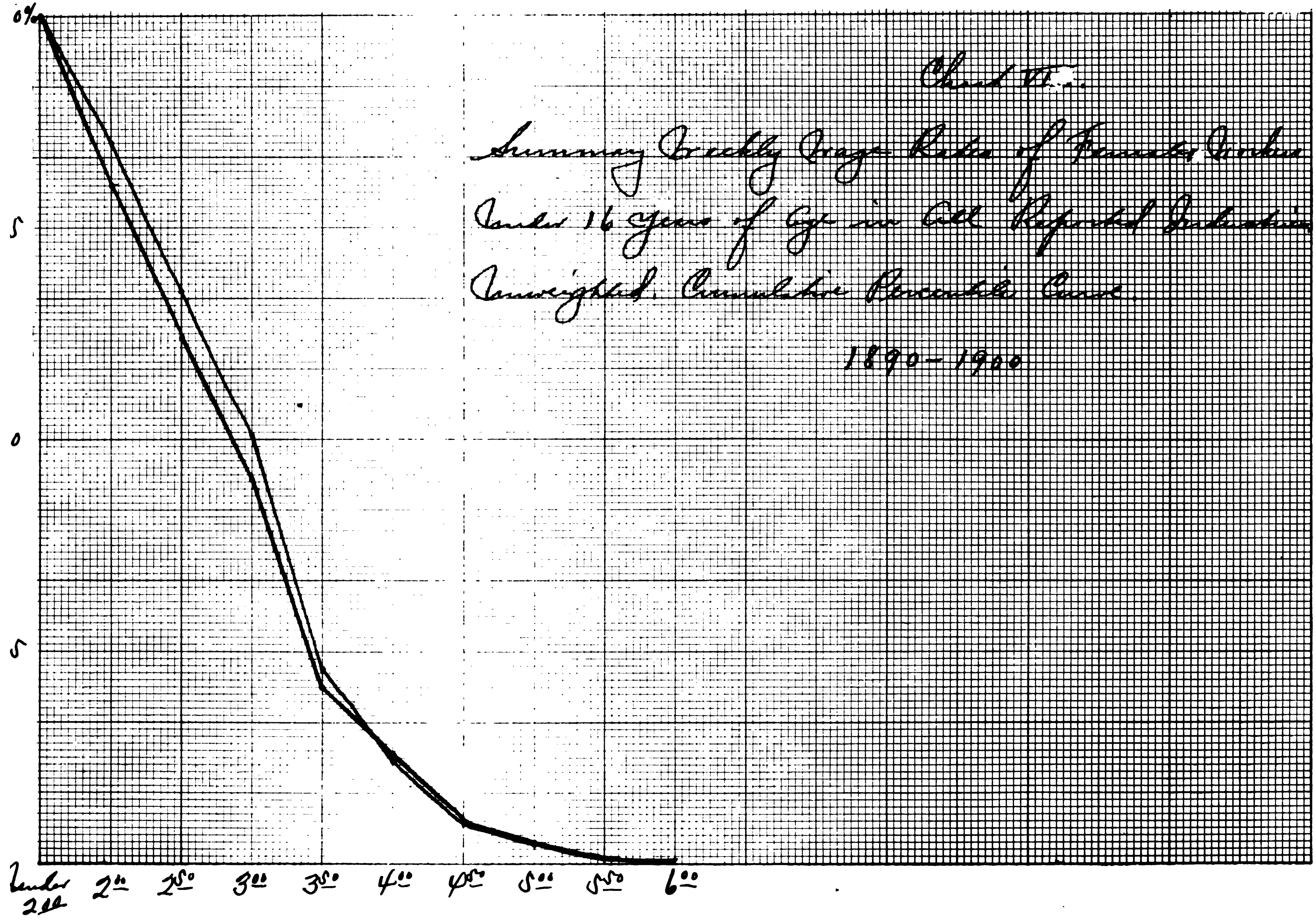
Chart VI.

Summary Weekly Wage Rates of Female Workers Under 16 Years of Age in All Reported Industries.

Unweighted. Cumulative Percentile Curve.

1890–1900



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females only seven industries were returned and these appear to be trustworthy only for textiles and shoes. Table X and XI below give these returns by wage groups for the males and females under 16 respectively, and the cumulative percentages are plotted in Charts V and VI. The results need but little comment. The wages paid seem disgracefully low for both sexes. For the females a fall is shown while for the males a decided upward movement is apparent for the two years.

TABLE X.

Summary of All Industries, Dewey Report. Distribution of Males Under 16 Years in Wage Groups. 1890-1900.

	1890.			1900.		
Rates per Week	Number	Absolute per Cents.	Cumulative per Cents.	Number	Absolute per Cents.	Cumulative per Cents.
Total	3,579	100.00	100.00	4,169	100.00	100.00
Under $2.00	321	8.97	100.00	222	5.32	100.00
$2.00-$2.49	238	6.65	91.03	261	6.26	94.68
2.50- 2.99	645	18.02	84.38	365	8.75	88.42
3.00- 3.49	823	23.00	66.36	973	23.34	79.67
3.50- 3.99	537	15.01	43.36	671	16.10	56.33
4.00- 4.49	329	9.19	28.35	508	12.19	40.23
4.50- 4.99	281	7.85	19.16	493	11.83	28.04
5.00- 5.49	118	3.30	11.31	143	3.43	16.21
5.50- 5.99	88	2.46	8.01	276	6.62	12.78

TABLE X (Continued).

		1890.			1900.	
Rates per Week	Number	Absolute per Cents.	Cumulative per Cents.	Number	Absolute per Cents.	Cumulative per Cents.
$6.00-$6.49	128	3.58	5.55	144	3.45	6.16
6.50- 6.99	25	.69	1.97	46	1.10	2.71
7.00- 7.49	19	.53	1.28	20	.48	1.61
7.50- 7.99	12	.34	.75	25	.60	1.13
8.00- 8.49	11	.31	.41	13	.31	.53
8.50- 8.99	2	.05	.10	8	.19	.22
9.00 & over	2	.05	.05	1	.03	.03

TABLE XI.

Summary for All Industries, Dewey Report. Distribution of Females Under 16 Years in Wage Groups. 1890-1900.

		1890.			1900.	
Rates per Week	Number	Absolute per Cents.	Cumulative per Cents.	Number	Absolute per Cents.	Cumulative per Cents.
Total	1,190	100.00	100.00	1,575	100.00	100.00
Under $2.00	178	14.96	100.00	314	19.94	100.00
$2.00-$2.49	208	17.48	85.04	285	18.09	80.06
2.50- 2.99	202	16.98	67.56	265	16.83	61.97
3.00- 3.49	329	27.65	50.58	384	24.38	45.14
3.50- 3.99	129	10.84	22.93	123	7.81	20.76
4.00- 4.49	88	7.40	12.09	129	8.19	12.95

TABLE XI (Continued).

Rates per Week	1890. Number	1890. Absolute per Cents.	1890. Cumulative per Cents.	1900. Number	1900. Absolute per Cents.	1900. Cumulative per Cents.
$4.50-$4.99	32	2.69	4.69	40	2.54	4.76
5.00- 5.49	20	1.68	2.00	28	1.78	2.22
5.50- 5.99	2	.16	.32	6	.38	.44
6.00- 6.49	2	.16	.16	1	.06	.06

None in either year above $6.00.

SECTION V.

AVERAGES AND METHODS OF TABULATION
IN WAGE STATISTICS,
WITH SPECIAL REFERENCE TO THE
DEWEY REPORT.

(a) THE ARITHMETIC AVERAGE

(b) THE MODE

(c) CONCENTRATION IN WAGE STATISTICS
REVEALED IN THE DEWEY REPORT.

SECTION V.

AVERAGES AND METHODS OF TABULATION IN WAGE STATISTICS.

The averages generally used for the presentation of wage statistics are the arithmetic average, the mode, and the median quartiles and deciles. In addition to these there is generally necessary some measure of dispersion, since the distribution of the wages at the various rates is quite as important as any average possibly can be. A simple measure of this kind is the formula, $\frac{Q^2 - Q'}{Q^2 + Q'}$,where Q' and Q^2 are the first and last quartiles. As a measure of distribution, the cumulative percentile curve used in this paper has several valuable features. It not only gives the entire data in the original form, and thus permits us to locate changes at any and every point, but it possesses the advantage of all graphic representations, that its significance is easily grasped at a glance. For this reason no further study has been made of distribution or of the medians and other percentile averages.

Next to be considered are the arithmetic average and the mode as applied to the Dewey Report. The arithmetic average in wage statistics is at present somewhat discredited by careful statisticians. Certainly, the average possesses few attributes of value for the student who views wages from the social side. The wages of two

men, one of whom receives 20 and another 30 cents an hour, mean an altogether different thing from the wages of two men one receiving 5 cents and the other 45; yet the averages are identical. On the other hand, we know that the arithmetic average, the median, and the mode in an absolutely natural distribution meet at the same point; and to get the arithmetic average in connection with our other averages, and not as a substitute for them, makes possible an interesting compaison of our data with the ideal frequency curve. For this reason I have endeavored to get approximate arithmetic averages for the two years under consideration. I have multiplied the centre amount ($2.25, $2.75, $3.25)in each wage group by thenumber in that group, added the amounts so obtained for each year, and divided by thetotal number of employees, thus getting an average weekly rate of wage. The group under $2.00 I placed at $1.75, and that over $20 at $24. The averages so obtained for the weighted data were for 1890 $11.41 and for 1900 $11.32. This average is, I feel certain, a maximum, and the minimum I would locate not far from $11.16 and $11.07 for 1890 and 1900, respectively. These minima are the results which would be obtained by computing the average from the lower limit of each wage group instead of from the middle point. This average is, it will be noted, for each year higher than the median, and it is also

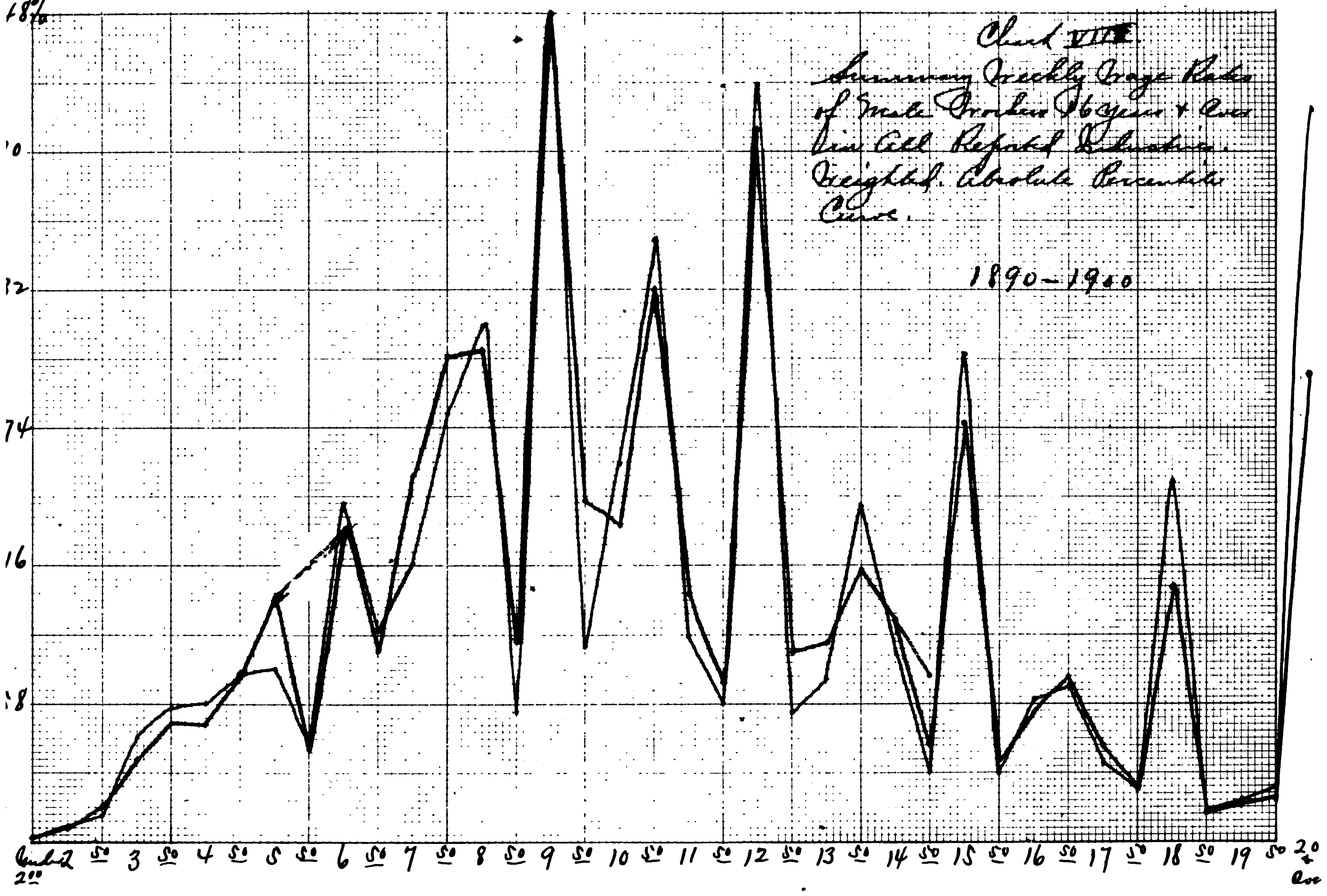
Chart VIII

Summary Weekly Wage Rates of Male Workers 16 Years + Over in All Reported Industries. Weighted. Absolute Percentile Curve.

1890–1940

higher than the mode. The reason for this is the tremendous weight which is given in the computation of an arithmetic average to the wages of the better paid workmen.

The mode as applied to wage statistics may be defined as "the style in wages." It is that wage received by a greater number of employees than is any other. It is of particular importance in wage data, as indicating the typical man. Thus the percentile points and the arithmetic average neglect absolutely the question of concentration of density, and may fall where there are practically no wage-earners whatsoever.. A glance over a Report of the Bulletin of Labor is as good as a trip to a department store bargain counter. Such wages as $1.47 per day, etc., are quite the rule. Yet who ever heard of a workingman knocking down his day's labor at $1.98 or $1.49? The mode as applied to the Dewey Report has been a most interesting study. Absolute per cents. are given in Table VI above, and these are plotted in the ordinary frequency curve for both years in Chart VII. The absolute irregularity of the figure is such that no results can be safely deduced therefrom as indicating the mode. There seem to be at least four prominent modes and many lesser ones. The $9.00 group stands out most prominently, but without further investigation we can hardly locate the mode at that point. Another test must therefore be applied. Thus far we have dealt with our data wholly in 50-cent groups. But it is possible

by simple addition to get it into $1, $1.50, $2, or other groups which are multiples of 50 cents. Our object in so doing is to secure regularity in our data, and this is finally obtained in the $3 grouping. The number of wage-earners from Table VI thus combined for both 1890 and 1900 into $3 groups are given in Table XII; and, since there are six 50-cent groups in each $3 group, it is possible, by shifting the point at which we begin to collect our groups, to get six different groupings of our data.

TABLE XII.

Distribution of Male Wage-earners
Sixteen Years and Over in $3.00 Wage Groups.

Rates a Week.	1890.	1900.
Under $2.00	503	975
$2.00 to $4.99	120,223	136,546
5.00 to 7.99	310,408	424,959
8.00 to 10.99	534,829	697,331
11.00 to 13.99	336,472	436,698
14.00 to 16.99	224,579	281,986
17.00 to 19.99	126,450	130,413
20.00 and over	135,502	123,601

TABLE XII. (Continued).

Rates a Week.	1890.	1900.
Under $2.50	3,666	4,305
$2.50 to $5.49	152,626	193,595
5.50 to 8.49	379,961	490,030
8.50 to 11.49	471,770	635,105
11.50 to 14.49	333,128	430,141
14.50 to 17.49	202,076	249,645
17.50 to 19.99	110,237	106,087
20.00 and over	135,502	123,601

Under $3.00	9,003	13,690
$3.00 to $5.99	167,213	208,038
6.00 to 8.99	386,634	517,899
9.00 to 11.99	473,696	622,193
12.00 to 14.99	318,851	415,893
15.00 to 17.99	198,405	239,201
18.00 to 19.99	99,662	91,994
20.00 and over	135,502	123,601

Under $3.50	30,558	34,343
$3.50 to $6.49	213,252	262,234
6.50 to 9.49	483,133	654,780
9.50 to 12.49	448,771	576,650
12.50 to 15.49	279,341	354,691
15.50 to 18.49	172,453	199,162
18.50 to 19.99	25,956	27,048

TABLE XII (Continued).

Rates a Week.	1890.	1900.
Under $4.00	58,054	64,774
$4.00 to $6.99	228,806	280,136
7.00 to 9.99	480,238	693,497
10.00 to 12.99	435,087	538,071
13.00 to 15.99	265,393	326,901
16.00 to 18.99	166,270	185,822
19.00 to 19.99	19,616	19,707
20.00 and over	135,502	123,601

Under $4.50	86,545	94,866
$4.50 to $7.49	257,073	343,624
7.50 to 10.49	500,883	680,438
10.50 to 13.49	390,989	508,346
13.50 to 16.49	261,134	309,096
16.50 to 19.49	145,842	161,975
19.50 to 19.99	10,998	10,563
20.00 and over	135,502	123,601

It will be noted that the mode in each one of the different groupings covers slightly different 50-cent groups.

These are

6.50	9.49
7.00	9.99
7.50	10.49
8.00	10.99
8.50	11.49
9.00	11.99

and, on the whole, only one 50-cent group is common to all the $3 model groups. That is the $9 to $9.49 group. Therefore, the mode may fairly be said to be in that group, and the typical male American factory worker may perhaps be said to be shown by the Dewey Report to be the man who receives $1.50 a day. No change appears in the mode between the two years.

This study of the mode brings out a most interesting phenomenon in connection with the grouping of wage-earners. I have already spoken of the absolute irregularity of the curve in Chart VII.. It remains to be noted that there is a remarkable regularity in this irregularity. The groups which stand out above the others as most prominent modes or points of concentration are the $5, $6, $8, $9, $10.50, $12, $13.50, $15, $16.50, and $18 groups. Of these only the $5 and $8 groups are not multiples of 3 x 50 cents. We are already familiar with the concentration in age statistics upon the years which are multiples of 5. It would seem that there is some similar concentration in wage statistics, if our returns are sufficiently numerous to prevent accidental groupings. Mr. Bowley, in his

"Elements of statistics," p. 147, says: "Average earnings for a year will not be reckoned exactly by shillings or even pence. If we had a sufficient number of instances, we should get regular sequences of earners at successive farthings, and the line representing them would have no sharp angles, but be continually curved." If the statement were merely that, it would not be open to criticism; but it is applied to a diagram showing rates per week, which exhibits almost the same phenomena as those presented in Chart VII. Whether 160,000 workers is a number sufficiently large to give "regular sequences," if such things really were inherent in our data, we will leave to our reader to judge. But may it not be possible that there are actually certain points of concentration in wage statistics? And, if this be true, it only remains to explain this concentration, derive the rule which governs it, and learn if it be actually true and inherent or merely error, like the concentration in age statistics. The reason lies, it would seem, in the factory system of wage payment. Payment is made, for the most part, in multiples of 1/2 cents an hour, and there would seem to be concentration on 5 x 1/2 cents and the multiples thereof. In other words, in week rates this means concentration on 30 cents and its multiples, with emphasis on the 5 multiples of 30 cents or the multiples of $1.50. this explains the concentration on all but the $5 and $8 groups, and shows why at $10.50

there are nearly twice as many as at $10. The $5 and $8 groups, however, contain two multiples of 30 cents, --namely $5.10 and $5.40, and $8.10 and $8.40; and all the groups which contain but one multiple of 30 cents are those groups in which there are but few wage-earners. In other words, the method of wage payment in use in American factories has entirely destroyed the regularity of the wage curve, and has created artificial modes at the various multiples of 5 x 30 cents, and there is a concentration on all the 30-cent multiples to a greater or less degree.

The grouping chosen by Professor Dewey was, unfortunately, such as to exaggerate the concentration. Of every three 50-cent groups, two contain two multiples of 30 cents, and one only one multiple. Thus in each of the groups which contained two multiples there tended to be twice the number of employees that there were in the group containing one multiple of 30 cents only. At first thought, indeed, it would seem that the data should have been arranged in 30-cent instead of 50-cent groups, in order that the irregularity of the groups might be reduced; but, on the other hand, we must remember that the sole object of grouping the data is to render it more intelligible and convenient, and surely a 30-cent arrangement would be necessarily clumsy and confusing. Moreover, the 30-cent multiple group itself depends entirely upon the number of hours in the day's labor, and a change to nine hours from

ten would give us the impossible 27-cent grouping as a logical rseult of our rule. On the whole, a grouping which fits evenly into the unit of our monetary system would seem to be the most convenient and desirable. Whether a 50-cent group is small enough is perhaps questionable; but, in view of the facts already presented, the value of a smaller one would perhaps be doubtful. A 10-cent group would be too small. A 25-cent basis would possess all the faults of the 50-cent one with no compensating features except that only one multiple of 30 cents could be contained in the group. Certainly for purposes of social investigation the 50-cent group is small enough.

But another question arises in connection with this concentration on these points which is very embarrassing to the theoretical statistician. This is the matter of smoothing thecurve. In Mr. Bowley's work, to which I have already referred is found , p. 154, the following discussion of a cumulative curve plotted from the data of the Aldrich Report, in which occur the same phenomena which we have found in those of the Dewey Report: "The irregularities shown by the thin line" (an unsmoothed line of absolute cumulative groups similar to those used in this paper) "do not arise from any law of wage grouping, but are due to the accidents of observation ; if we regard these returns as samples out of a much larger unregistered group, we may suppose that a smoothed curve will indicate approximately the

form which would be obtained if our returns were complete." Proceeding upon the theory enunciated above, Mr. Bowley applied to his data certain methods of interpolation, the result of which is a beautifully smoothed curve. But we have already pointed out that these irregularities do arise from a law of wage grouping. They are not due to the accidents of observation , and therefore we may not suppose that returns from every establishment in the country would give us a smoothed curve. If this be the case, is it not true that for correct statistical purposes we may neither smooth the curve nor interpolate? The purpose of smoothing thecurve should be to eliminate error, and not to disguise the truth. For this purpose we smooth periodic curves and the age curve. But the irregularities of the wage curve are truth. Wage rates do concentrate about certain definite points, and to assume an even distribution is to assume a thing which is unwarranted by the facts. Moreover, it is customary to estimate the median and other percentile points "accurately" by this graphic method. Thus in Chart II we may locate the median at $10.50 and $10.73 rsepectivelyfor 1900 and 1890. Yet we are morally certain that in both years nearly every man in that group received $10.50 and our median so found is worthless. For instance there might have been a change within the group say the concentration in 1890 was on $10.50, in 1900 $10.80 yet the group would remain the same and the medians show a fall

instead of a rise. For this reason the use of the smoothed curve or of interpolation in cases of this kind is extremely dangerous and is likely to mislead. As a test of this concentration the cumulative percents given in the Dewey Report for the Slaughtering industry were plotted in the cumulative curves shown in Chart VIII. The slaughtering industry in the large packing houses of Chicago and Kansas City has been reduced to a rigid "gang" system described by Prof. John R. Commons in the Quarterly Journal of Economics for 1905 and by this statement we know that the concentration shown by theChart to exist in certain groups is really a concentration on certain points. To locate the median by the graphic method at about $10.75 knowing as we do that probably not a single man is getting $10.75 and knowing that the median man is actually getting $10.50 is clearly unjustifiable. The concentration, while due to our monetary system, is true, and is there, and the statistician has no right to smooth it out of existence.

This concentration however is marked only in the data for adult males. Though apparent it is not notable in thedata for boy's or for women's and girl's wages as is shown in Charts IX, X and XI. This may be explained by the probable facts that these workers have not yet been included in the hour system of wage payment.

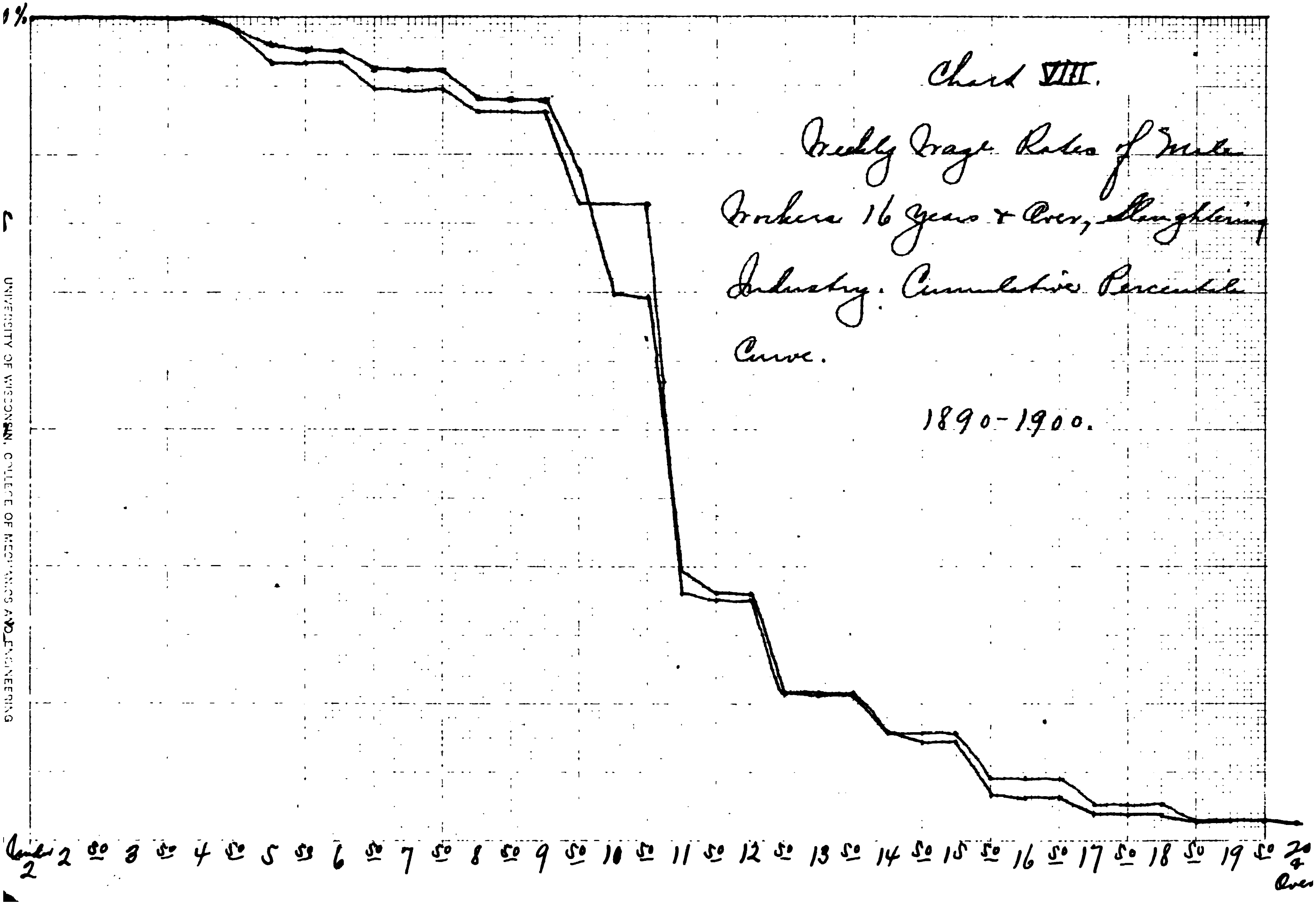

Chart VIII.

Weekly Wage Rates of Male Workers 16 Years & Over, Slaughtering Industry. Cumulative Percentile Curve.

1890-1900.

UNIVERSITY OF WISCONSIN, COLLEGE OF MECHANICS AND ENGINEERING

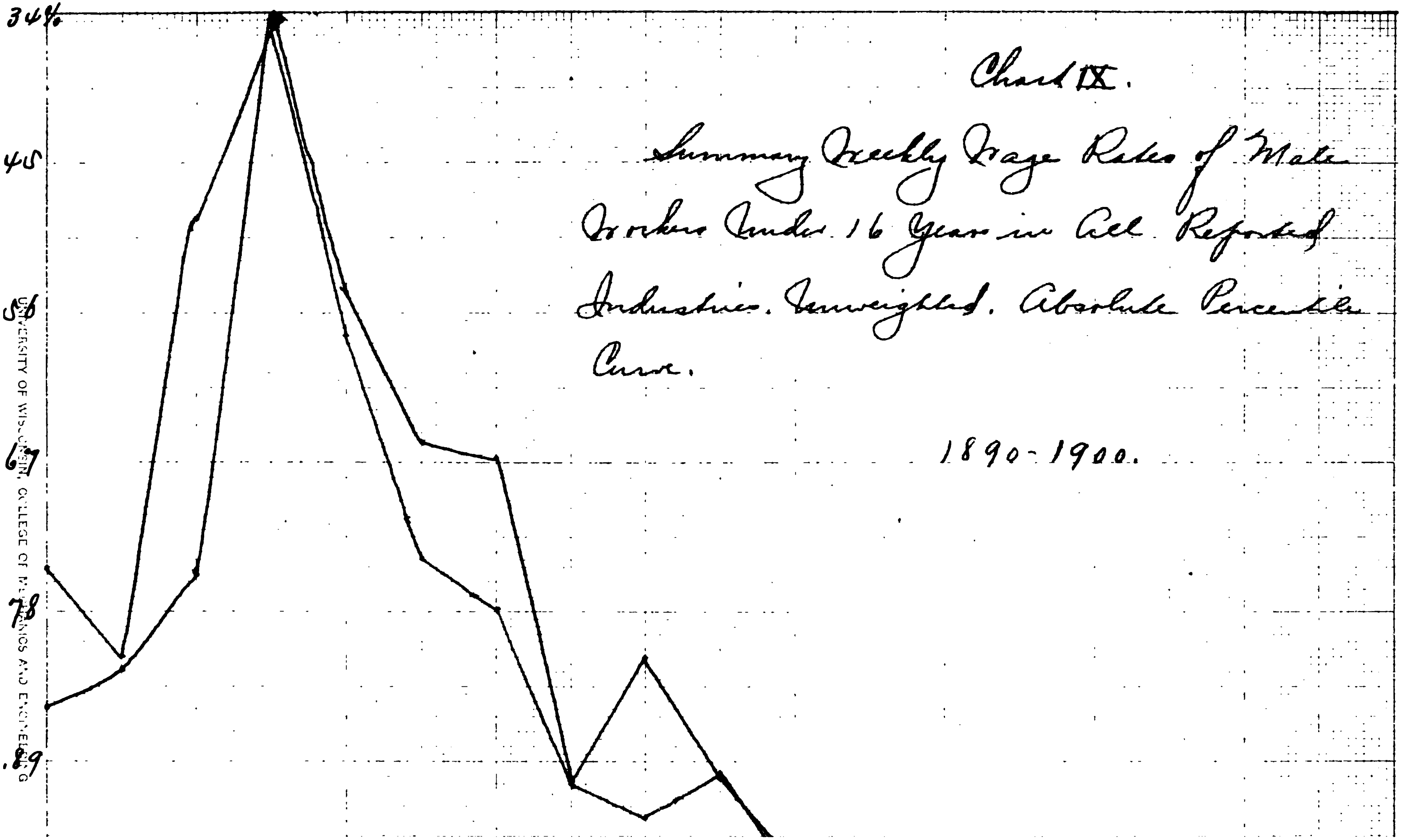

Chart IX.

Summary Weekly Wage Rates of Male Workers Under 16 Years in All Reported Industries. Unweighted. Absolute Percentile Curve.

1890-1900.

UNIVERSITY OF WISCONSIN, COLLEGE OF MECHANICS AND ENGINEERING

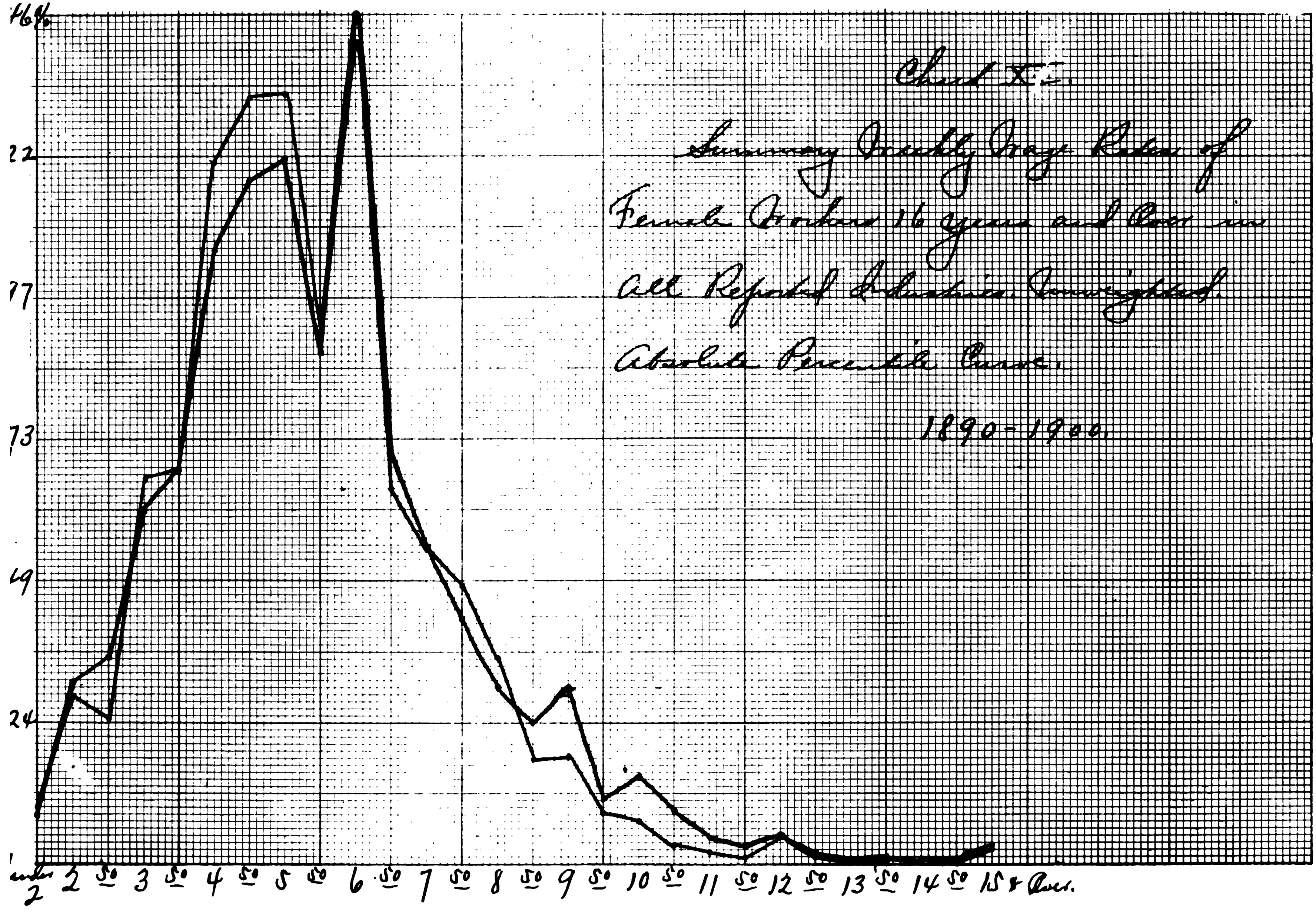

Chart XI.

Summary Weekly Wage Rates of Female Workers 16 years and Over in All Reported Industries. Unweighted.

Absolute Percentile Curve.

1890-1900.

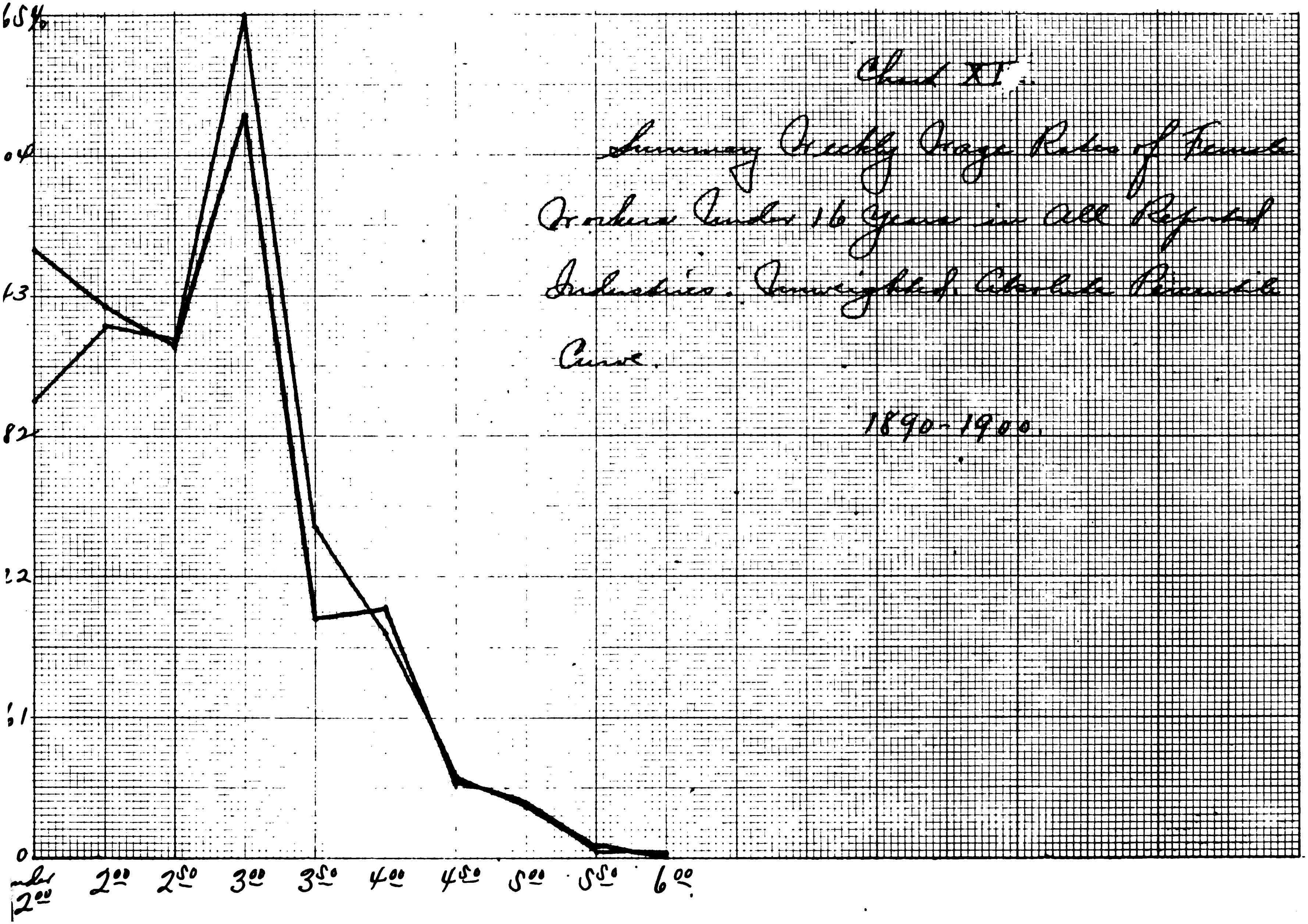

Chart XI.

Summary Weekly Wage Rates of Female Workers Under 16 Years in All Reported Industries. Unweighted. Absolute Percentile Curve.

1890-1900.

CONCLUSION

We have examined in detail some of the most important parts of the Dewey Report. Much has been left untouched. The report gives rates per hour and earnings in a week for all classes of labor investigated. Thus our study has by no means exhausted the rich mine of information contained in this excellent report. The results of our examination may be thus summarized:-

1. The Dewey Report is fairly representative but there is a slight overweighting of the Central States.
2. The restriction of the data collection to manufacturing establishments in existance in both 1890 and 1900 was wrong in principle and dangerous in practice.
3. Adult male wages were lower in 1900 than 1890, the wages of adult females higher, of male children higher, and of female children lower.
4. The arithmetic average and the mode also indicate a lower average of adult male wages in 1900.
5. Wage rates concentrate about the points of "even money" payments producing irregularity in the true wage curve.

On the whole this paper has not been primarily an effort to discover the facts relative to the level of wages

in manufactures in 1890 and 1900. In view of the present chaotic state of wage statistics in this country , results in any investigation are of less importance than the methods used and the statistical points made clear. While I believe that the Dewey Report shows clearly that adult male wage-earners in manufactures earned less in 1900 than in 1890, I think it is of vastly greater importance to remember that that report has brought to the fore the wage group and the percentile summary, - methods that are far superior to any others yet devised to indicate by statistics of wages the welfareof the laboring class.

Tabulation I.

The Distribution of Adult Male Wage Earners by Industries and Amount Groups of Rates of Wages as Found in the Dewey Report Weighted by the Total Number of Adult Males in Each Industry.

1890.

Tabulation II.

Same Weighted Distribution . 1900.

TABULATION I, 1890.

Industries	Less than 2..	2.00 2.49	2.50 2.99	3.00 3.49	3.50 3.99	4.00 4.49
1.Carpet Mills				18	54	483
2.Cotton Mills	247	1,265	370	3,115	3,331	3,640
3.Dyeing & Fin. Textiles				195	492	660
4.Knitting Mills			106	530	901	106
5.Woolen Mills	12	35	82	599	999	1,152
6.TOTAL, TEXTILES	259	1,300	558	4,457	5,777	6,041
7.Agric. Implements		19	19	159	393	599
8.Furniture		105	949	1,292	1,345	1,002
9.Lumber & Planing		316		176	35	316
10.Pianos		15	178	1,155	548	414
11.Wagons & Carriages		123	982	798	675	1,074
12.TOTAL, WOODWORKING		578	2,128	3,580	2,996	3,405
13.Car & R. R. Shops		276	138	598	276	1,795
14.Foundries & Metals	99	335	454	2,969	1,835	2,999
15.Iron & Steel Mills	18	18	123	648	481	490
16.Shipyards		21	53	373	126	289
17.TOTAL, METALWORKING	117	650	768	4,588	2,718	5,573
18.Bakeries				193	450	1,544
19.Breweries		236	123		472	66
20.Candy		95	634	824	570	158
21.Chemicals				36	43	40
22.Cigars			171	85	1,194	1,621
23.Clothing				2,688	4,121	1,971
24.Collars & Cuffs				81	20	141
25.Distilleries						
26.Flour Mills						137
27.Glass			221	858	1,131	1,170
28.Paper Mills						54
29.Potteries				153		153
30.Brickyards					3,018	
31.Printing	108	251	394	1,433	1,290	1,971
32.Rubber			14	154	118	59
33.Shoes			200	1,732	3,065	2,465
34.Slaughtering					121	587
35.Tanneries		16	33	295	197	869
36.Tobacco	19	37	93	398	195	466
37.TOTAL, ALL INDUSTRIES	503	3,163	5,337	21,555	27,496	28,491

TABULATION I. Continued. 1890

Ind-us-tries	4.50 4.99	5.00 5.49	5.50 5.99	6.00 6.49	6.50 6.99	7.00 7.49	7.50 7.99	8.00 8.49
1.	322	1,199	36	1,002	72	412	304	805
2.	6,972	4,442	2,776	10,332	4,935	3,763	6,816	4,133
3.	752	604	65	1,877	1,561	883	2,164	1,208
4.	1,379	371	53	1,060	583	318	1,326	1,750
5.	1,786	1,387	987	4,348	2,268	5,065	4,430	1,892
6.	11,211	8,003	3,917	18,619	9,419	10,441	15,040	9,788
7.	814	627	346	1,161	777	1,676	1,620	4,373
8.	1,582	1,846	1,424	3,851	976	2,084	7,200	3,297
9.	809	527	246	2,496	1,406	457	5,590	17,897
10.	266	355	163	503	133	222	370	326
11.	828	521	1,104	2,638	6,227	1,381	4,325	4,233
12.	4,299	3,876	3,283	10,649	9,519	5,820	19,105	30,126
13.	1,036	737	3,522	1,957	5,156	6,513	3,798	7,688
14.	4,449	3,482	1,125	6,333	7,409	6,699	14,286	14,286
15.	1,164	1,409	1,164	3,527	4,131	9,172	9,566	8,376
16.	215	152		1,003	294	1,680	782	1,108
17.	6,864	5,780	5,811	12,820	16,990	24,064	28,432	31,458
18.	354	1,093	64	1,222	32	933	547	1,640
19.	85	161	28	57	123	132	406	236
20.	475	444	254	919	317	665	63	1,141
21.	65	65	11	194	18	245	998	2,046
22.	1,365	2,815	1,365	2,389	1,365	1,280	1,791	2,644
23.	2,150	3,942	2,150	5,555	896	6,450	1,434	5,375
24.		81	40	101		40	40	61
25.				39		39	425	
26.	137	137		914	91	91	457	777
27.	819	1,339	377	910	637	1,027	1,391	1,235
28.	375	187		455	80	80	1,660	4,257
29.	115	192	153	1,111	230	115	2,414	77
30.				754			4,149	3,772
31.	860	1,827	537	3,046	502	2,401	466	2,078
32.	77	86	41	122	59	68	254	272
33.	2,465	3,931	1,466	4,397	1,999	1,999	3,797	2,598
34.	1,621	140		1,267	9	9	913	5
35.	557	1,066	131	1,705	557	705	3,524	5,459
36.	287	401	296	349	207	154	210	74
37.	34,181	35,566	19,924	67,594	43,050	56,758	87,516	105,119

TABULATION I. Continued.
1890.

Industries	8.50 8.99	9.00 9.49	9.50 9.99	10.00 10.49	10.50 10.99	11.00 11.49	11.50 11.99
1.	322	3,096	251	877	107	537	18
2.	1,265	7,619	3,486	1,974	4,010	1,758	278
3.	381	1,022	381	465	167	808	37
4.	212	1,326	159	106	477	318	106
5.	588	2,949	752	799	1,669	1,093	317
6.	2,768	16,012	5,029	4,221	6,430	4,514	756
7.	637	3,876	1,245	1,255	2,425	1,058	983
8.	2,189	7,280	1,160	5,064	4,088	2,084	949
9.	844	15,646	2,637	4,500	3,129	492	2,742
10.	89	1,110	148	311	340	311	30
11.	859	5,123	2,485	3,160	2,332	2,608	368
12.	4,618	33,035	7,675	14,290	12,314	6,553	5,072
13.	1,312	8,884	3,452	5,133	5,133	3,982	3,775
14.	4,775	27,318	7,182	7,458	10,447	4,755	2,772
15.	3,650	6,241	7,580	5,523	25,838	2,775	4,341
16.	551	1,239	247	756	583	467	142
17.	10,288	43,682	18,461	18,870	42,001	11,979	11,030
18.	193	2,123	960	3,473	354	1,672	289
19.	444	1,180	283	1,209	1,454	689	2,342
20.	32	760		602	32	539	
21.	407	1,192	857	429	1,617	267	403
22.	2,047	2,389	1,450	2,559	1,365	2,047	1,535
23.	717	9,318		11,828	358	3,763	3,942
24.		141	40	182		20	20
25.		1,275	193	232	850	155	
26.		5,987	366	3,931	5,987	823	46
27.	1,872	2,756	728	1,001	1,248	1,508	585
28.	776	6,746	669	294	1,981	214	134
29.	38	1,111	307	383	613	345	192
30.		13,958	377	377	18,862	377	
31.	573	5,840	358	4,228	537	1,612	502
32.	127	1,224	240	276	227	236	
33.	666	5,463	999	3,864	3,264	1,599	1,266
34.	5	4,859	14	23	20,090	303	70
35.	918	4,934	1,115	5,032	1,869	2,836	311
36.	108	108	34	99	9	9	28
37.	26,597	164,093	40,155	77,403	121,462	42,060	28,523

TABULATION I. Continued. 1890

Ind-us-tries	12.00 12.49	12.50 12.99	13.00 13.49	13.50 13.99	14.00 14.49	14.50 14.99	15.00 15.49	15.50 15.99
1.	1,485		125	555	89		376	
2.	4,072	1,573	617	987	370		1,203	93
3.	901	74	139	74	46	9	334	
4.	795	53	53	477	53		477	
5.	2,421	1,340	235	940	341	71	882	141
6.	9,674	3,040	1,169	3,033	899	80	3,272	234
7.	3,371	927	918	1,395	749	469	1,863	478
8.	7,095	844	1,793	3,877	1,029	818	3,138	343
9.	2,707	1,793	246	2,918	105	141	2,918	105
10.	1,095	74	281	607	488	133	710	104
11.	5,705	307	1,074	2,056	1,258	521	2,362	61
12.	19,973	3,945	4,312	10,853	3,629	2,072	10,991	1,091
13.	8,815	3,522	5,823	7,618	4,534	3,107	8,102	3,314
14.	15,872	3,522	5,357	11,552	6,373	3,246	12,874	3,029
15.	5,873	1,873	1,698	4,394	2,276	1,558	3,483	1,313
16.	2,389	126	1,318	1,512	1,187	215	2,499	205
17.	32,949	9,043	14,196	25,076	14,370	8,126	26,958	7,861
18.	5,820	257	2,959	32	2,444	96	1,672	
19.	2,077	2,351	1,010	2,087	1,010	123	3,891	19
20.	1,363	63	95	32	254		475	
21.	616	382	155	342	357	86	292	32
22.	1,877	2,644	1,535	512	2,815	1,194	2,133	341
23.	10,752	717	2,329	896	5,196		6,988	
24.	242	40	61	40	101		202	40
25.	657	77	116		116		193	
26.	9,094	46	320	2,377	366		6,626	46
27.	2,262	754	585	1,040	611	663	923	260
28.	1,847		107	348	107		1,392	134
29.	1,111	307	192	230	38	153	728	345
30.	19,239			11,694			9,806	377
31.	4,335	717	2,078	752	3,905	717	7,954	1,075
32.	299	23	36	208	32		113	
33.	7,461	1,532	1,532	3,531	1,466	799	11,859	533
34.	4,641	121	14	2,236	191		1,822	14
35.	2,836	393	492	1,607	803	131	1,328	115
36.	43	19	12	19	6	6	40	6
37.	139,168	26,471	33,305	66,945	38,716	14,246	99,658	12,523

TABULATION I. Continued.

1890.

Ind- us- tries	16.00 16.49	16.50 16.99	17.00 17.49	17.50 17.99	18.00 18.49	18.50 18.99	19.00 19.49	19.50 19.99
1.	179	54	18		304		89	18
2.	62	370	62		740	62	32	278
3.	9	93		9	177		19	9
4.		159	53	53	636		106	106
5.	118	341	106	23	787	35	23	47
6.	368	1,017	239	85	2,644	97	269	458
7.	506	515	281	169	655	206	243	169
8.	1,134	686	870	290	1,530	158	132	475
9.	527	1,266	773	35	1,336		70	352
10.	459	59	104	15	281		59	15
11.	1,043	890	429	337	1,780	31	123	123
12.	3,669	3,416	2,457	846	5,582	395	627	1,134
13.	3,475	4,764	3,429	3,061	5,754	1,220	783	1,220
14.	3,394	5,465	1,500	1,726	7,113	1,056	858	2,673
15.	1,094	2,643	1,208	1,497	1,645	919	1,742	989
16.	520	1,460	221	5	756	16	47	583
17.	8,483	14,332	6,358	6,289	15,268	3,211	3,430	5,465
18.	579	96	514	32	772		32	
19.	755	104	840	113	3,834	28	113	47
20.	63	32	63		507			
21.	65	54	36	90	151	7	47	32
22.	2,047	1,621	256	853	1,877	512	682	1,024
23.	4,300	538	1,971		13,082	358	538	
24.	182		40	20	141		20	
25.					116		39	
26.	366	1,188	183	137	3,154	46	91	137
27.	481	221	312	234	598	559	247	416
28.	80	535	27	27	777			80
29.	613	383	422	345	805	498	230	230
30.					10,562			
31.	5,303	2,114	1,899	1,326	6,593	537	1,899	1,183
32.	9	32	5		50			5
33.	1,199	3,198	400	67	5,796	67	333	600
34.	79	1,221	51	23	884	9	5	168
35.	393	279	131	82	557	16	16	16
36.	12	9	9	6	6			3
37.	29,046	30,390	16,213	10,575	73,706	6,340	8,618	10,998

TABULATION I. Continued. 1890.

Industries.	20.00 and Over.	Total All Wage Groups.
1.	448	13,655
2.	1,789	88,837
3.	895	16,510
4.	638	14,846
5.	1,070	42,130
6.	4,840	175,978
7.	1,361	38,327
8.	3,458	77,437
9	2,740	78,293
10.	740	12,211
11.	3,126	63,070
12.	11,425	269,338
13.	7,435	141,137
14.	11,500	228,577
15.	16,917	147,357
16.	1,488	24,628
17.	37,340	541,699
18.	904	33,345
19.	1,363	29,491
20.	411	11,882
21.	234	11,911
22.	6,052	59,452
23.	17,752	132,075
24.	166	2,303
25.	231	4,753
26.	2,831	46,889
27.	5,085	36,064
28.	592	24,015
29.	2,070	16,402
30.	1,876	99,198
31.	37,233	110,434
32.	43	4,509
33.	3,798	91,406
34.	820	42,285
35.	409	41,733
36.	27	3,804
37.	135,502	1,788,966

TABULATION II. 1900.

Ind- us- tries	Less than 2.00	2.00 2.49	2.50 2.99	3.00 3.49	3.50 3.99	4.00 4.49	4.50 4.99	5.00 5.49
1.			16	65	82	180	581	623
2.	394	590	918	2,328	6,230	4,263	11,413	7,936
3.				84	10	553	897	782
4.				323	462	554	370	1,201
5.		9	17	291	379	899	1,594	1,418
6.	394	599	951	3,091	7,163	6,449	14,855	11,960
7.	4		12	31	208	220	382	371
8.	25		505	1,490	2,274	1,794	1,920	2,400
9.		116	116		29	29	1,301	347
10.			908	454	454	371	258	289
11.		59	29	468	820	1,054	527	1,054
12.	29	175	1,570	2,443	3,785	3,468	4,388	4,461
13.		99		218	79	1,584	1,841	1,247
14.	41	79	1,694	2,446	2,919	3,078	5,511	4,099
15.		52	78	320	511	649	1,377	2,476
16.		95	112	402	402	502	100	296
17.	41	325	1,884	3,386	3,911	5,813	8,829	8,118
18.				99	398	1,459	431	1,492
19.				335	440	314	272	31
20.		83	416	693	416	915	1,081	1,275
21.			10	42	85	72	105	82
22.		117	58	876	934	1,635	934	1,460
23.		1,691	3,495	2,593	5,750	3,044	3,382	3,608
24.				220	19	201		143
25.								
26.				52	26	78	26	52
27.		9	9	1,017	1,902	1,045	857	2,401
28.							679	32
29.	507	169	169	338	1,351	844	1,351	18,410
30.				1,254				
31.		42	208	1,952	914	1,827	747	2,533
32.			27	208	326	236	281	290
33.		42	419	1,425	2,389	1,634	1,676	2,472
34.					149	201	1,765	209
35.				198	187	264	495	1,089
36.	4	78	169	431	286	593	501	261
37.	975	3,330	9,385	20,653	30,431	30,092	42,655	60,379

TABULATION II. 1900 Continued.

Ind- us- tries	5.50 5.99	6.00 6.49	6.50 6.99	7.00 7.49	7.50 7.99	8.00 8.49	8.50 8.99
1.	521	799	16	901	344	884	475
2.	5,935	9,969	11,478	9,804	7,968	6,099	3,476
3.	542	2,058	2,481	3,222	2,711	1,636	1,157
4.	185	2,448	1,201	185	3,048	1,755	185
5.	1,216	2,115	3,234	3,357	4,827	2,256	1,427
6.	8,399	17,389	18,410	17,469	18,898	12,630	6,720
7.	421	915	1,089	583	1,764	1,363	1,000
8.	1,516	4,420	2,021	3,890	8,386	5,658	3,081
9.	144	1,445	1,532	665	5,894	11,993	2,399
10.	217	320	227	485	433	382	722
11.	468	2,108	3,308	2,547	3,806	3,689	790
12.	2,766	9,208	8,177	8,170	20,283	23,085	7,992
13.	2,632	2,533	3,384	13,540	13,143	14,708	3,483
14.	2,146	10,345	4,313	11,163	24,748	21,145	10,221
15.	537	4,208	3,385	14,087	14,719	12,442	8,407
16.	22	1,824	284	1,383	970	1,657	312
17.	5,337	18,910	11,366	40,173	53,580	49,952	22,423
18.	66	2,088		2,022	298	2,519	
19.	10	314	891	220	440	199	21
20.	554	1,026	139	637	665	748	
21.	75	226	124	330	1,337	2,268	474
22.	409	1,635	1,051	2,277	2,160	2,277	1,810
23.	2,593	4,397	676	7,892	1,240	6,313	113
24.	10	277		220	10	201	10
25.	38	57			209		
26.		679	78		261	810	131
27.	772	1,243	1,168	1,384	2,015	1,083	1,017
28.		517	420	550	2,813	7,016	1,229
29.	338	3,716	507	844	5,574	338	169
30.		251	1,254	3,010	2,509	1,254	251
31.	374	3,696	1,329	3,447	1,454	3,945	1,038
32.	27	381	145	199	1,341	843	172
33.	1,257	4,735	1,341	2,095	2,724	2,137	3,017
34.	37	1,698	37	37	2,190	52	30
35.	385	1,990	1,012	2,353	3,848	7,653	4,992
36.	381	416	208	251	141	127	88
37.	23,828	74,849	48,333	93,580	123,990	125,450	51,697

TABULATION II. 1900. Continued.

Industries	9.00 9.49	9.50 9.99	10.00 10.49	10.50 10.99	11.00 11.49	11.50 11.99	12.00 12.49
1.	2,834	589	426	295	295	311	492
2.	6,460	4,755	4,132	4,787	2,952	2,755	8,427
3.	2,659	313	699	490	323	125	1,335
4.	2,125	554	277	831	92	46	1,293
5.	2,652	1,136	1,154	1,595	916	899	2,097
6.	16,730	7,347	6,688	7,998	4,578	4,136	13,644
7.	10,680	2,984	1,645	3,177	1,378	1,668	3,706
8.	7,982	3,183	3,359	6,254	2,046	1,137	11,190
9.	12,254	4,045	2,052	6,501	1,156	1,821	3,843
10.	660	784	474	382	1,300	330	918
11.	6,558	2,138	3,250	2,167	1,640	1,054	5,943
12.	38,134	13,134	10,780	18,491	7,520	6,010	25,600
13.	25,669	9,144	7,303	9,956	4,849	4,710	11,779
14.	37,259	18,040	10,611	18,509	8,199	6,991	21,863
15.	12,823	6,459	5,853	23,334	9,904	4,546	8,268
16.	3,062	284	993	4,245	669	469	5,227
17.	78,813	33,927	24,760	56,044	23,621	16,716	47,137
18	4,508	232	4,342	530	2,254		9,744
19.	1,247	10	755	3,364	178	755	2,159
20.	1,996	388	527		388		1,331
21.	1,644	2,330	1,363	2,141	703	163	1,399
22.	2,452	2,686	2,627	2,452	2,627	1,343	2,978
23.	8,681	1,353	9,132	564	3,044	3,270	9,470
24.	67	29	134	19	38	29	96
25.	759	38	152	778	360		474
26.	3,892	392	2,143	6,818	522	52	8,386
27.	3,352	753	1,055	1,846	1,431	621	2,213
28.	11,416	2,846	485	3,427	970		2,652
29.	1,183	169	507	844			169
30.	10,037	7,024	251	6,021	7,526		11,290
31.	4,319	831	5,564	2,160	2,367	1,869	8,305
32.	3,081	544	770	517	580	36	797
33.	6,369	1,006	4,274	3,520	1,257	3,352	7,584
34.	5,638	9,696	134	21,474	1,847	119	7,909
35.	7,257	2,188	3,958	1,847	1,385	275	2,815
36.	155	127	120	28	28	39	35
37.	211,730	87,050	80,521	140,883	63,224	38,785	166,187

TABULATION II. 1900. Continued.

Ind-us-tries	12.50 12.99	13.00 13.49	13.50 13.99	14.00 14.49	14.50 14.99	15.00 15.49	15.50 15.99	16.00 16.49
1.	508	115	344	197	393	410	180	148
2.	2,788	1,935	984	328	328	1,279	197	361
3.	84	156	115	94	31	236	10	63
4.		231	554	185	46	739		46
5.	821	467	1,198	907	423	907	291	97
6.	4,201	2,904	3,195	1,711	1,221	3,571	678	715
7.	1,154	1,498	2,147	1,405	1,085	1,934	660	436
8.	1,036	1,591	3,006	1,061	606	2,299	227	733
9.	1,792	116	2,341	722	1,589	1,878		838
10.	578	485	598	1,052	351	639	371	454
11.	556	1,523	1,610	1,405	322	3,894	59	1,435
12.	5,116	5,213	9,702	5,645	3,953	10,644	1,317	3,896
13.	4,770	4,097	11,045	8,352	3,384	12,173	6,768	7,718
14.	6,963	10,321	14,917	7,526	5,776	17,802	4,444	4,979
15.	19,014	6,104	4,139	7,057	2,736	4,979	3,048	2,381
16.	435	1,662	4,702	1,233	803	3,782	363	708
17.	31,182	22,184	34,803	24,168	12,699	38,736	14,623	15,786
18.	431	2,718	66	3,579	563	3,546		1,094
19.	493	4,370	1,058	2,431	42	7,514	10	1,530
20.	28	637	139	360		388		222
21.	111	203	778	382	33	542	46	23
22.	2,627	1,927	2,277	2,335	701	2,744	1,751	1,168
23.	226	2,819	226	4,848		3,720	113	2,706
24.	86	115		67		48	10	38
25.	190	38	19	76		171		
26.	183	157	2,143	496	26	4,154	235	78
27.	650	725	744	819	461	1,055	414	377
28.	226	97	1,035	97	32	1,520	65	65
29.			169					
30.		1,003	2,760	753		502		
31.	664	2,118	1,786	5,896	498	9,883	664	2,866
32.	82	100	480	36	9	417		82
33.	1,131	2,389	3,813	1,509	4,065	10,853	670	1,969
34.	82	60	2,965	737	7	4,007	52	164
35.	748	1,012	1,056	715	220	924	33	187
36.	14	7	21	7	7	46		25
37.	48,471	50,796	69,235	56,667	24,537	104,985	20,681	32,991

TABULATION II. 1900. Continued.

Industries	16.50 16.99	17.00 17.49	17.50 17.99	18.00 18.49	18.50 18.99	19.00 19.49	19.50 19.99	20.00 & Over
1.	49	33		295		49		410
2.	656	328	33	787	66		230	2,352
3.	52	42	42	142	10	10	10	1,245
4.	323	92	92	370			92	1,249
5.	291	44	17	440	35	35	149	991
6.	1,371	539	184	2,034	111	94	481	6,247
7.	598	232	185	540	108	39	104	448
8.	1,794	1,238	667	1,112	253	379	126	2,664
9.	665	376	29	1,445	58	29	347	2,096
10.	320	340	134	340	72	144	41	691
11.	556	615	264	2,020	59	293	87	3,106
12.	3,933	2,801	1,269	5,457	550	884	705	9,005
13.	8,490	3,899	1,861	5,522	1,247	1,148	633	3,911
14.	9,893	2,671	3,568	8,972	1,632	1,994	3,050	15,130
15.	3,065	3,030	2,225	2,623	1,913	1,325	1,524	19,920
16.	2,449	67	887	2,823	6	39	853	1,622
17.	23,897	9,667	8,541	19,940	4,798	4,506	6,060	40,583
18.	166	265		1,127	33	99		1,757
19.	1,111	975	126	4,967	42	241	63	1,457
20.		55		277		28		443
21.	141	33	75	278	13	13	108	380
22.	1,518	992	817	1,284	876	525	992	4,836
23.	564	2,142	226	13,755	113	226		9,375
24.	10	10		48	19	29	10	178
25.				57		19		188
26.	784	209	314	1,777			131	1,334
27.	480	395	245	565	226	278	405	7,146
28.	711	32	32	1,326		129	323	805
29.			169	169				167
30.	251	251	251	502				1,751
31.	3,488	5,149	872	8,305	166	1,703	540	32,445
32.	109	27	18	172			54	174
33.	2,137	545	880	2,095	335	335	419	3,345
34.	1,326	97	30	514			261	1,286
35.	121	121	44	286	55	33	11	645
36.	7	21		11	4	7		54
37.	42,125	24,326	14,093	64,946	7,341	9,144	10,563	123,601

TABULATION II. 1900. Continued.

Industries.	Total All Wage Groups.
1.	13,860
2.	135,721
3.	24,419
4.	21,154
5.	40,601
6.	235,755
7.	46,174
8.	93,323
9.	72,003
10.	16,978
11.	61,281
12.	289,759
13.	216,919
14.	345,058
15.	219,518
16.	45,744
17.	827,239
18.	47,926
19.	38,385
20.	15,855
21.	18,132
22.	62,168
23.	123,360
24.	2,391
25.	3,623
26.	36,419
27.	42,173
28.	41,547
29.	38,171
30.	59,956
31.	125,964
32.	12,561
33.	91,215
34.	64,810
35.	50,402
36.	4,698
37.	2,232,509

Approved L Adams.

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